

A REVISION OF THE AMERICAN MOTHS OF THE FAMILY GELECHIIDÆ, WITH DESCRIPTIONS OF NEW SPECIES.

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Since Dr. C. V. Riley's List of *Tineina*¹ nothing has been published on this group in America except isolated descriptions of single species and their life histories.

Dr. Riley followed the classification generally in use at that time, founded on Stainton's and Heinemann's works, although Edward Meyrick² previously had published his masterly rearrangement of the group based on natural evolutionary lines, a work which, as Lord Walsingham has said,³ after the fuller exploitation of the system in the Handbook of British Lepidoptera, "marks an epoch in the study of these insects."

Since then the views of Meyrick have been generally adopted and great strides have been made by European specialists in the study of these insects. A much more satisfactory appreciation of the value and relationship of the genera and families now prevails than was formerly the case.

The following arrangement of the American Gelechiidæ consists in the application to the American fauna of the results of these advanced studies.

In this work I have been greatly assisted by Mr. Edward Meyrick. Numerous concrete questions have been made clear for me by his valuable assistance, which he has most liberally and untiringly extended.

Much kind help also has been received from Lord Walsingham and Mr. John Hartley Durrant, whose large collections and intimate knowledge of the American forms made their aid particularly valuable.

Without the previous work and the liberal help and encouragement from these authorities in England my task would have been much more difficult, if not an impossible one.

As a basis for this paper I have examined all the authentic material of former workers which is still in existence on this side of the Atlantic, together with much new material.

¹ In J. B. Smith's List Lep. Bor. Am., 1891.

² Trans. Ent. Soc., London, 1883.

³ Proc. Zool. Soc., London, 1897.

From Miss Mary Murtfeldt, the Nestor among students in this group in America, I have received not only material but also much interesting information, which no one else could have supplied, particularly concerning some of Chambers' species.

To Prof. C. H. Fernald and to Dr. William G. Dietz I am under obligation for allowing me to study their collections in their homes, also for various suggestions and for specimens.

Professor Fernald's collection included that of Miss Murtfeldt, with her types and many of the types of Chambers and of Lord Walsingham. Of especial value were those specimens furnished with Lord Walsingham's blue labels, which were passed upon by him in 1882.¹ A notebook in Lord Walsingham's handwriting, with notes and determinations, corresponding to the numbers on these blue labels, was loaned me by Professor Fernald, thus enabling me also to verify identifications of many specimens in the Museum of Comparative Zoology, Cambridge, Massachusetts, especially those which formerly belonged to the Peabody Academy of Science, in Salem, Massachusetts.

Dr. Dietz's collection contained his types and several specimens named by Lord Walsingham.

The collection in the museum in Cambridge contains nearly all of Zeller's types and a great many of Chambers', besides the specimens named by Lord Walsingham. This collection proved the richest of any in authentic specimens, and although careful discrimination was necessary among Chambers' types, many species were identified here which would otherwise have remained unknown to me. I am indebted to Mr. Samuel Henshaw for much courtesy and information given me during my stay in Cambridge, as well as for sending me many specimens needed for reexamination after my return to Washington.

The collection of the Philadelphia Academy of Natural Sciences has unfortunately but a few of Clemens' types left. There are, however, some types and specimens named by Lord Walsingham. To the curator, Dr. H. Skinner, I owe thanks for giving me every facility for examining the collection and manuscripts.

The Belanger collection, formerly in the Laval University, Quebec, containing Chambers' types of Canadian *Tineina*, was obtained by the writer through the courtesy of the present curator, Rev. Dr. C. E. Dionne, and is now in the U. S. National Museum.

What little was left of the late Mr. William Saunders' collection of *Tineina*, consisting of fragments of some of Chambers' types, was secured, together with some new Canadian material for the U. S. National Museum, through the kind agency of Dr. J. Fletcher, Ottawa, Canada.

From Mr. William D. Kearfott I received for study a well-pre-

¹ Trans. Am. Ent. Soc., Phila., X, 165-204.

served collection of about 800 unnamed American Gelechiidæ with the most liberal permission to retain desired specimens.

Smaller collections, on similar liberal conditions, have been received from Mr. Nathan Banks and through Dr. Harrison G. Dyar from Dr. W. Barnes and Prof. C. P. Gillette.

Rev. Dr. Fyles has kindly sent me certain specimens and information.

Finally and principally, there was the collection in the U. S. National Museum, which contains many types of Riley, Murtfeldt, Walsingham, Chambers, and Zeller, besides a great many specimens determined by Lord Walsingham and Mr. William Beutenmüller, together with a considerable number of bred or collected miscellaneous specimens, including the collections of Dr. H. G. Dyar, in Florida, Colorado, and elsewhere; of Mr. E. A. Schwarz, in Texas, Arizona, and Colorado; of Prof. T. D. A. Cockerell, in New Mexico; of Messrs. Coquillett and Koebele, in California; and fine series of many species, with notes, bred during many years in the insectary of the United States Department of Agriculture, largely by Mr. Th. Pergande. The Museum also contains Dr. Ottmar Hofmann's large collection of excellently mounted specimens of European species, authentically determined, which naturally has proved of very valuable assistance.

Mr. Coquillett has kindly given me his private notes on some of his bred specimens. These are credited under the species.

To Dr. Harrison G. Dyar I owe much gratitude for the continued interest and encouragement given me during my studies, as well as for actual help, and last, but not least, for aid in reading and correcting this manuscript and proofs.

The purpose of the present paper is not to present an exhaustive monographical treatise on American Gelechiidæ. The group is not well enough known as yet for such treatment. It is rather a revision of what has already been done, so that future work may proceed on a sounder foundation.

The genus *Gelechia* has been for former workers much as Chambers expressed it, "a waste box, a convenient receptacle for every species which could not be better disposed of."¹

Such new genera as were erected from this miscellaneous aggregation, especially those separated by Chambers, were most frequently given insufficient characterization. To study these genera critically, to substantiate and define more fully those which were found tenable, and to eliminate those erected on superficial characters, and then to place as far as possible the described species where they belong has been the principal object of the writer.

For this reason I have described only about 50 new species, such as

¹Can. Ent., IX, p. 231.

had been either bred or belonged to some specially interesting group or were so commonly received for determination as to make a name for them desirable.

If my purpose had been to describe new species, four times as many could as easily have been found in the material at my disposal, but it was believed that the ultimate benefit to science would be better served by leaving these many species unnamed until they have been bred or at least had been obtained in larger and more well-preserved series than we have at present.

Of the 43 genera included in the family Gelechiidæ in Riley's list, 21 have been removed to other families and 8 more have been found to be synonyms of other genera; while, on the other hand, one genus has been recovered from another family in Riley's list, 5 old genera of American authors have been resurrected, 9 genera from other faunas have been identified in America, and 6 new genera have been added, of which 3 are described in the present paper, thus making 35 genera now recognized as North American.

In Riley's list the genus *Gelechia* contained the large number of 213 species, not counting most of Walker's species and some others which were omitted. The number has now been reduced to less than 100, and of these 54 remain in the genus only because they are unrecognized, and they are therefore liable to be removed to some other genera when identified. These unrecognized species are the great drawback to work in this group. The types and all authentic material of most of them are lost, and the descriptions furnish no clew to their proper genera, rendering recognition very difficult and uncertain. Still several of them may be rediscovered, especially by diligent search in Chambers' old collecting grounds in Kentucky, from where, practically, no material has been received since his death.¹

The collections of the British Museum remain to be studied; there should be found the types of Walker's unrecognized species, as well as some of Clemens', which he sent to Stainton forty years ago.

The family Gelechiidæ as defined by Meyrick and as used in this paper comprises moths with the following characters: Head smooth or at most slightly ruffled. Antennæ simple or slightly serrate, rarely ciliate, in a single American genus with pecten on the basal joint. Labial palpi long, curved, ascending; terminal joint usually acutely pointed. Maxillary palpi obsolete or very small, appressed. Posterior tibiæ more or less rough haired above.

Forewings normally with 12 veins, sometimes with only 11 or 10 by coincidence of veins; 7 and 8 normally stalked, sometimes coincident;

¹The writer has, since this was written, been so fortunate to have a short but strenuous collecting period in this locality, securing much valuable material of Tineina, among which, however, were strangely few Gelechiidæ. It is hoped that in the future the active cooperation of local entomologists may be counted on.

7 to costa; vein 1b furcate at base. Hindwings normally with 8 veins, exceptionally with only 7 or 6 by veins 6 and 5 being obsolete; vein 8 more or less distinctly connected with the cell by a cross vein. The form of the hindwing is more or less trapezoidal, termen is usually sinuate or emarginate below apex.

This last character is always diagnostic when present, as it is not found outside of this family. In the few more generalized genera, where the termen is not sinuate, veins 7 and 6 in the hindwings are approximate, connate, or stalked, thereby differing from the nearest allied family *Oecophoridae*.¹

The larvæ of Gelechiidae exhibit great differences in coloration and habits. Normally they have three pairs of thoracic feet, five pairs of abdominal prolegs, and feed in folded or spun leaves or shoots or in stems or seed heads. Less commonly they are leaf miners.

They spin a cocoon, and the pupa does not protrude when the imago emerges. The pupa has segments 9–11 free.

In separating the genera in the Gelechiidae the wing venation and the characters of the labial palpi are especially employed; of these the former is by far the most important.

While differently modified palpi and other external characters, as modifications of the antennæ, the presence or absence of raised scales, or hair pencils of different forms, may indicate generic differences, they are far less reliable than the venation, and only to be taken into consideration in connection with it.

These external characters are more apt to be modified by changed life habits or other influences in the adaptation to environments, but the venation will only undergo changes slowly through a long period of evolution, and is consequently more important in the determination of genera. This is strikingly illustrated by finding the identical characteristic tufted palpi in different families; in *Ypsolophus* and *Leuce* in the Gelechiidae, in *Eumeyrickia* in the Oecophoridae, and in *Plutella* in the Plutellidae.²

The raised scales on the forewings are found here and there in all the families, while the hair pencil in the male at the base of the hindwings, used as the sole character by Lord Walsingham to distinguish his genus *Eucatoptus* from *Aristotelia* is found in several Gelechiid genera, and is not constant within these.

Even such a specialized modification as the antennal notch found in *Glyphiphocera* and *Anorthosia* in the Gelechiidae recurs again in the

¹As defined by Meyrick in his Handbook of British Lepidoptera.

²This might at a superficial view appear to prove just the opposite, and the palpi be claimed to be the persistent character while the venation had undergone changes; but it is very evident from the relationship, or rather lack of relationship, that this is not the case and that the tufted palpi are developed independently in the different families.

Blastobasidae and a very similar one in the genus *Bucculatrix* in the Tineidae.

The reason for these strangely recurring specializations is difficult to explain and will not be fully understood before we learn the true biological use of them, but that they do recur is sufficient proof of their secondary value as generic characters.

Thus it will be found that within the same genus the palpi may vary considerably, while the venation will be found to be very constant, at most varying in the coincidence of two veins, already long-stalked in the allied species, or the obliteration of a transverse vein, which in the related forms had a tendency to become obsolete.

Of the 35 genera now recognized in this family from North America 7 are widely distributed, cosmopolitan or nearly so; 7 others are found in Europe; 2 are recorded from Africa, and 19 have not been recognized outside of North America, including the West Indies.

They may be separated by the following synoptic table:

Forewings with veins 7 and 8 out of 6	1
Forewings with vein 6 separate or out of base of 7	11
1. Basal joint of antennæ with pecten	<i>Sitotroga</i> , p. 781
Basal joint without pecten	2
2. Forewings with one or more veins absent	3
Forewings with all veins present	4
3. Forewings with vein 11 absent	<i>Agrippa</i> , p. 789
Forewings with vein 11 present	<i>Helice</i> , p. 804
4. Hindwings with veins 3 and 4 separate	5
Hindwings with veins 3 and 4 connate or stalked	7
5. Hindwings of male with costal row of bristles	<i>Glauce</i> , p. 783
Hindwings without such row	6
6. Second joint of labial palpi with long spreading hairs	<i>Paltodora</i> , p. 775
Second joint of labial palpi merely rough-haired beneath	<i>Metzueria</i> , p. 773
7. Hindwings with vein 6 absent	<i>Eriippe</i> , p. 805
Hindwings with vein 6 present	8
8. Forewings with veins 3 and 4 stalked	<i>Trypanisma</i> , p. 815
Forewings with veins 3 and 4 not stalked	9
9. Forewings with veins 2, 3, 4, and 5 separate equidistant	<i>Epithectis</i> , p. 816
Forewings with veins 2, 3, and 4 approximate, long; vein 2 distant, short...	10
10. Second joint of labial palpi with long expansible tuft on inner side.	
.....	<i>Eucordylea</i> , p. 807
Labial palpi without such tuft	<i>Recurvaria</i> , p. 807
11. Forewings with veins 2 and 3 stalked	12
Forewings with veins 2 and 3 separate	16
12. Second joint of labial palpi with long projecting tuft	13
Labial palpi without such tuft	14
13. Tuft expansible	<i>Anorthosia</i> , p. 917
Tuft not expansible	<i>Ypsolophus</i> , p. 920
14. Hindwings narrower than forewings	<i>Strobisia</i> , p. 904
Hindwings broader than forewings	15
15. Male antennæ with deep notch near base	<i>Glyphiplocera</i> , p. 916
Male antennæ without such notch	<i>Trichotapha</i> , p. 906
16. Forewings with one or more veins absent	<i>Menesta</i> , p. 902
Forewings with all veins present	17

17. Hindwings (at least in male) bilobed	18
Hindwings not bilobed	19
18. Hindwings with vein 6 present.....	<i>Neodactylota</i> , p. 835
Hindwings with vein 6 absent.....	<i>Nealyda</i> , p. 790
19. Hindwings with a vein absent	20
Hindwings with all veins present	21
20. Hindwings with vein 6 absent.....	<i>Chrysopora</i> , p. 792
Hindwings with vein 5 absent	<i>Dacotoma</i> , p. 837
21. Hindwings with veins 6 and 7 parallel.....	22
Hindwings with veins 6 and 7 approximate, connate, or stalked	27
22. Hindwings with veins 3 and 4 separate	23
Hindwings with veins 3 and 4 connate or stalked.....	25
23. Second joint of labial palpi with long projecting tuft.....	<i>Leuce</i> , p. 793
Second joint of labial palpi without such tuft	24
24. Costal margin of forewings impressed before apex.....	<i>Euchrysa</i> , p. 919
Costal margin of forewings normal	<i>Aristotelia</i> , p. 794
25. Hindwings of male with costal hair pencil	<i>Phthorinuca</i> , p. 821
Hindwings of male without hair pencil	26
26. Second joint of labial palpi with large divided brush; terminal joint thick- ened.....	<i>Gnorimoschemia</i> , p. 823
Second joint without divided brush; terminal joint thin	<i>Paralechia</i> , p. 820
27. Hindwings with veins 3 and 4 separate	28
Hindwings with veins 3 and 4 connate or stalked.....	29
28. Second joint of labial palpi with long projecting tuft.....	<i>Autoneda</i> , p. 782
Labial palpi without such tuft	<i>Telphusa</i> , p. 783
29. Terminal joint of labial palpi in male short, concealed.....	<i>Anarsia</i> , p. 928
Terminal joint long, exposed	30
30. Second joint of labial palpi rough beneath.....	<i>Gelechia</i> , p. 851
Second joint of labial palpi smooth	31
31. Terminal joint of labial palpi thickened, laterally compressed.....	<i>Prostomus</i> , p. 837
Terminal joint slender.....	32
32. Hindwings with termen sinuate.....	33
Hindwings with termen not sinuate	<i>Anacamptis</i> , p. 844
33. Terminal joint of labial palpi shorter than second	<i>Polygynus</i> , p. 839
Terminal joint longer than second	<i>Aprocremna</i> , p. 840

METZNERIA Zeller.

Plate XXVIII, fig. 1.

Metzneria ZELLER, Isis, 1839, p. 197.

As Lord Walsingham has shown,¹ this name should be used for the genus, which Duponchel² later named *Parasía*, under which name it is treated by Meyrick.³

This genus is defined by Meyrick as follows:

Labial palpi very long, more or less thickened with somewhat loose scales, terminal joint much shorter than second. Forewings elongate, narrow, pointed 7 and 8 out of 6. Hindwings under I, elongate-trapezoidal, apex acute, produced, termen sinuate, cilia 2; 3 and 4 remote, parallel, 5 approximated to 6, 6 and 7 somewhat approximated.

¹ Ent. Mo. Mag., XXXV, 1899, p. 199.

² Cat. Meth. Lep. Eur., 1846, p. 350.

³ Handbook British Lepidoptera, 1895, p. 570.

The genus is very near and correlated with *Paltodora* Meyrick, developed from *Aristotelia* and differing mainly in the labial palpi. This difference has proven even less marked than defined by Mr. Meyrick, by the knowledge of allied forms in the American fauna and the consequent widening of the genus *Paltodora* (p. 775).

Three species have been described as *Parasia* from America, namely:

1. *Apicistrigella* Chambers, afterwards transferred by Chambers to *Gelechia*. This species is an *Aprocerema* and will be found treated under that genus (p. 840).

2. *Griseella* Chambers, afterwards transferred by Chambers to *Gelechia*. This species probably does not belong to either genus, but is at present unrecognized and will be found treated under the doubtful species of *Gelechia* (p. 890).

3. *Subsimella* Clemens. This species, which was placed with a query in *Parasia* by Clemens, and which subsequently has been retained there, can not, as the description proves, belong in this genus. It will be found treated under *Epitheatis* (p. 816).

Thus the following species is the only representative of the genus *Metzneria* at present recognized from America.

METZNERIA LAPPELLA Linnæus.

Metzneria lappella STAUDINGER and REBEL, Cat. Lep. Eur., II, No. 2491, 1901.—
BUSCK, Dyar's List Amer. Lep., No. 5539, 1903.

This well-known European and Asiatic species, not hitherto recorded from America, has probably within quite recent years extended its range to this country.

Two years ago Mr. Samuel Henshaw submitted to me several specimens, which he had bred in 1899 from the heads of burdock collected in the swamps around Cambridge, Massachusetts. I had no difficulty in referring them to this species, but sent specimens to Mr. Meyrick, in England, for authoritative substantiation, and he kindly informed me that it was *lappella* Zeller.

I have also identified it in Professor Fernald's collection, bred from burdock in Ontario, Canada. In the U. S. National Museum are, besides the specimen received from Mr. Henshaw, others received from Rev. Thomas W. Fyles, Quebec, Canada, and a large series bred by the writer from heads of burdock received from Mr. Arthur Gibson, of the Department of Agriculture, Ottawa, Canada. Several larva are often found in a single head, and from a small handful of heads sent by Mr. Gibson nearly 100 moths issued.

The larva is short and thick, yellowish white, with brown head; thoracic feet small, and abdominal legs nearly obsolete.

The species overwinters as larva and does not pupate before the spring; the imago issues in May and June.

PALTODORA Meyrick

Plate XXVIII, fig. 2.

Cleodora (CURTIS), Meyrick, Handbook Brit. Lep., 1895, p. 571.

This genus is defined by Meyrick in his Handbook British Lepidoptera, 1895, as:

Second joint of labial palpi with long, rough, spreading hairs beneath, terminal as long as second. Forewing 7 and 8 out of 6. Hindwing under 1, elongate-trapezoidal, apex pointed, produced, termen emarginate, cilia 3; 3 and 4 remote, parallel, 5 nearer 6, 6 and 7 approximated.

Most of the American species differ from this definition in having terminal joint of labial palpi shorter than second joint, and veins 6 and 7 in hindwing are more properly said to be connate than approximate. In all other respects they agree absolutely, and the chief characteristics of each species are so unmistakably near to the European forms that one genus only can find justification, and the definition of the genus should be widened by the two alterations—terminal joint as long as second *or shorter*, and 6 and 7 in hindwing approximate *or connate*.

I have recognized the following 12 species, which may be separated by the table, but great care should be taken in determining the species, as they are very similar:

With white costal streak at beginning of cilia.....	1
Without such streak	7
1. Part of costal edge, white	2
Costal edge, not white.....	4
2. With white dashes in costal cilia.....	<i>magnella</i> , p. 776
Without such dashes	3
3. Ground color light yellowish brown.....	<i>pallidistrigella</i> , p. 776
Ground color dark brown	<i>canicostella</i> , p. 778
4. Head and thorax whitish	5
Head and thorax brown	6
5. Antennæ nearly unicolorous	<i>striatella</i> , p. 775
Antennæ sharply annulated	<i>ciliolineella</i> , p. 777
6. With dorsal apical white streak	<i>dietziella</i> , p. 777
Without such.....	<i>anteliella</i> , p. 778
7. Entire wing with white-tipped scales.....	8
No white-tipped scales or only at margins	9
8. Anterior wings with longitudinal ochreous streaks	<i>similiella</i> , p. 779
Without such streaks	<i>pallidella</i> , p. 780
9. Color light yellowish brown	<i>sabulella</i> , p. 778
Color dark ashy brown, alar exp. 16–23 mm	<i>tophella</i> , p. 780
Color pale umber brown, alar exp. 10–11 mm.....	<i>modesta</i> , p. 781

PALTODORA STRIATELLA Hübner.

Paltodora striatella HÜBNER, Staudinger and Rebel, Cat. Lep. Eur., II, No. 2935, 1901.—BUSCK, Dyar's List Amer. Lep., No. 5540, 1903.

Cleodora striatella WALSINGHAM, Insect Life, I, 1888, p. 82.—RILEY, Smith's List Lep. Bor. Am., No. 5516, 1891.

This European species has been recorded by Lord Walsingham from Colusa County, California. In the United States National Museum is a good series of authentic European specimens. I have met with a single specimen in the Henry Edwards collection in the American Museum of Natural History in New York, presumably from the United States but without locality label.

It feeds, according to European writers, in stems of *Tanacetum*, a weed common also in this country.

Veins 6 and 7 in hindwings are closely approximated.

PALTODORA PALLIDISTRIGELLA Chambers.

Cleodora pallidistrigella CHAMBERS, Can. Ent., VI, 1874, p. 244; U. S. Geol. Surv., Bull., IV, 1878, pp. 92, 135.—WALSINGHAM, Insect Life, I, 1888, pp. 81, 82.—RILEY, Smith's List Lep. Bor. Am., 1891, No. 5514.

Paltodora pallidistrigella BUSCK, Dyar's List Amer. Lep., 1903, No. 5541.

The type No. 467, U.S.N.M., received from Chambers and bearing a label in his handwriting, agrees well with the description and undoubtedly represents this species. This is the same specimen which Lord Walsingham had before him in 1888, and it has his blue label, No. 1184.

The white costal edge, together with the nearly perpendicular white costal streak and its light yellow color, separate it from the other species at present known; I have two other specimens beside the type agreeing exactly with this. They are like the type from Texas.

This is the species which differs most from Meyrick's definition of the genus in respect to labial palpi, the terminal joint being only half as long as second joint; veins 6 and 7 are distinctly connate.

PALTODORA MAGNELLA, new species.

Paltodora magnella BUSCK, Dyar's List Amer. Lep., 1903, No. 5542.

Antennæ dark brown, annulated with white. Labial palpi white, a small oblong spot on the upper and outer side of second joint dark brown, tip of terminal joint dark brown.

Face, head, and thorax white, slightly shaded with brown. Anterior wings yellowish gray, two outer thirds of costal edge white; a small black spot on fold and two elongated black white-edged dashes on the middle of the wing in continuation of each other, sometimes forming one uninterrupted black line.

From apical fourth of costa a thin oblique white line outward to termen; above this four white dashes in the costal cilia, and opposite it correspondingly a dorsal white line emitting three white pencils into the dorsal cilia; cilia whitish with three heavy black transverse lines at apex. Hindwing dark gray, cilia yellowish. Legs light brown, tarsi white, annulated with black.

Alar expanse.—15.5 to 16.5 mm.

Habitat.—Colorado.

Type.—No. 6345, U.S.N.M.

Other specimens are in Dr. Dietz's collection, where it was labeled *striatella* Hübner, from which species it differs by the white costal edge and the stronger annulation of the antennæ, besides being a much larger species.

PALTODORA CILIALINEELLA Chambers.

Gelechia cilia lineella CHAMBERS, Can. Ent., VI, 1874, p. 242; Bull. U. S. Geol. Surv., IV, 1878, pp. 91, 142; Can. Ent., X, 1878, p. 52.—RILEY, Smith's List Lep. Bor. Am., 1891, No. 5337.

Paltodora cilialineella, Busck, Dyar's List Amer. Lep., 1903, No. 5543.

Chambers pointed out the great similarity of this species to his species of *Cleodora*, and added:¹

I have not examined the neuration, but I am inclined to transfer the species to *Cleodora*.

I have compared the type No. 445, U.S.N.M., bearing Chambers's own label, with his type in the Museum of Comparative Zoology in Cambridge. They are identical and agree well with his description, evidently truly representing the species.

They are *Paltodora*, with the brush on second joint of labial palpi somewhat rubbed off.

The species is very near *pallidistrigella*, differing principally in the absence of the costal white edge and in the direction of the costal white line, which in this species is nearly parallel with the edge of costal cilia, while in *pallidistrigella* it is nearly perpendicular on it.

The differences pointed out by Chambers (Ref. 2) are not well borne out by his types.

Veins 6 and 7 of hindwing are connate.

PALTODORA DIETZIELLA, new species.

Paltodora dietziella Busck, Dyar's List Amer. Lep., 1903, No. 5544.

Palpi missing. Antennæ silvery white with dark brown annulations. Face white; head and thorax light fawn colored. Forewings fawn colored, at base concolorous with thorax, but becoming deeper toward the tip; on fold at middle of the wing a small black streak; at end of disk a small black dot. At the beginning of costal cilia obliquely outward across the tip of the wing a thin white line, and opposite it from the dorsal edge another thin white line curved upward and outward, nearly but not quite meeting the costal streak at the dorsal edge near the tip; both are continued out into and meet in the dorsal cilia, which is yellowish fuscous and contains two other white pencils below the continuation of the streaks.

In the cilia at apex is one heavy black transverse line, and outside

¹ Bull. U. S. Geol. Surv., IV, p. 91.

this three thin black lines. Edging the costal white streak superiorly is a dark brown patch.

The ornamentation is very near that of *pallidistrigella*, with the same ground color and general pattern, but differs in the lack of the white costal edge and in the direction of the white costal streak, which in this species forms a narrow Greek ν with the dorsal streak, while in *pallidistrigella* it is shorter and much more nearly perpendicular.

Hindwings dark fuscous, cilia a shade lighter; veins 6 and 7 connate. Abdomen yellowish fuscous, with numerous scattered metallic blue and greenish scales. Legs light yellow.

Alar expanse.—16 to 16 mm.

Habitat.—Colorado. July.

Type.—No. 6346, U.S.N.M.

Cotypes in collection of Dr. Dietz, who has liberally submitted this species to me for description and in whose honor I name it.

PALTODORA CANICOSTELLA Walsingham.

Cleodora canicostella WALSINGHAM, Insect Life, I, 1888, p. 82.—RILEY, Smith's List Lep. Bor. Am., 1891, No. 5518.

Paltodora canicostella BUSCK, Dyar's List Amer. Lep., 1903, No. 5545.

Described from Mount Shasta, California; cotypes are in U. S. National Museum, where is also a specimen from Colorado. Veins 6 and 7 in hindwings are connate.

PALTODORA ANTELIELLA, new species.

Paltodora anteliella BUSCK, Dyar's List Amer. Lep., No. 5546, 1903.

Antennæ light fawn colored; labial palpi fawn colored, above whitish; face, head, and thorax light fawn colored. Anterior wings darker reddish brown; one short longitudinal streak on the fold and one similar in the middle of the wing black; second discal stigma circular black. From costal apical one-fourth very obliquely outward across the wing to termen a thin white line. Cilia fawn colored with a short, heavy black transverse line in apical part. Hindwings dark gray; cilia fawn colored; abdomen and legs light reddish brown; tarsal joints slightly tipped with white.

Alar expanse, 12 to 12.5 mm.

Habitat.—New Jersey.

Type.—No. 6347, U.S.N.M.

Cotypes in collections of Dietz and Kearfott. The small size and rich brown color make this species easily recognizable.

PALTODORA SABULELLA Walsingham.

Cleodora sabulella WALSINGHAM, Insect Life, I, p. 83, 1888.—RILEY, Smith's List Lep. Bor. Am., No. 5520, 1891.

Paltodora sabulella BUSCK, Dyar's List Amer. Lep., No. 5547, 1903.

Described from Colusa County, California. Cotypes are in U. S. National Museum. Hindwings with veins 6 and 7 connate.

PALTODORA SIMILIELLA Chambers.

Gelechia similiella CHAMBERS, Can. Ent., IV, 1872, p. 193.

Gelechia solaniella CHAMBERS, Can. Ent., VI, 1874, p. 242; Bull. U. S. Geol. Surv., III, 1877, p. 91; IV, 1878, pp. 91, 147.

Gelechia [*Doryphora*] *piscipellis* ZELLER, Verh. k. k., zool.-bot. Gesell. Wien, XXIII, 1873, p. 277.

Gelechia piscipellis RILEY, Smith's List Lep. Bor. Am., No. 5450, 1891.

Gelechia piscipalis CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 145.

Paltodora similiella BUSCK, Dyar's List Amer. Lep., No. 5548, 1903.

Not *Gelechia solaniella* CHAMBERS, Can. Ent., V, 1873, p. 176; Conn. Quart. Journ. Sci., II, 1875, p. 239; Can. Ent., IX, 1878, p. 51.

This species has been quite troublesome to clear, owing to an erroneous determination by Chambers and the subsequent results of this mistake.

Only by the kind help of Miss Mary Murtfeldt's personal recollection, and with all obtainable evidence carefully examined, did I feel justified and confident in my conclusions in regard to the above synonymy.

Later I have had the satisfaction to have them substantiated in part through a letter from Lord Walsingham in the archives of the Division of Entomology, U. S. Department of Agriculture.

Chambers described¹ a species as *Gelechia similiella*. This was the same species that Zeller subsequently described as *piscipellis*, as comparison of the original types now in Cambridge, but presented by Chambers to the Peabody Academy of Science in Salem, shows, and it is a true *Paltodora*.

In 1873 Chambers received from Miss Murtfeldt a superficially similar species, which she had reared from *Solanum*, and believing it (wrongly) to be *similiella* Chambers, he changed that name to *solaniella* and gave *Solanum carolinensis* as its food plant,² and later he described it³ more fully and gave the life history in detail, still supposing it to be his original *similiella*.

Afterwards Miss Murtfeldt, unaware of this, described her species as *cinerella* Murtfeldt, afterwards changing it to *inconspicua*, the former name being preoccupied in Europe.

It was, however, already described by Zeller as *Gelechia* (*Bryotropha*) *glochinella* and belongs in Mr. Meyrick's recent genus *Phthorimaea*. (p. 821.)

To enable me to draw these conclusions I have had the good fortune to have the following authentic specimen for examination: 1. U. S. National Museum, type, No. 459, Chambers type with his label: *Gelechia solaniella* Chambers. This is identical with 2. the other original type sent to Peabody Academy, Salem, now in Museum of Comparative Zoology, bearing Lord Walsingham's blue label, No. 992 and Chambers' label No. 37, each referring to respective lists of the

¹ Can. Ent., IV, p. 193.

² Idem., V, 1873, p. 176.

³ Miss Murtfeldt's species.

two authors, which I have had the use of through the kindness of Professor Fernald, and Mr. Henshaw, respectively.

These two specimens, which evidently represent his original species, are *Paltodora* species and identical with 3. Zeller's type in Cambridge of *piscipellis*, and with 4. a specimen determined as *piscipellis* Zeller by Lord Walsingham, in U. S. National Museum.

Of the other species, bred from Solanum, I had 5. cotype and several other specimens, bred by Miss Murtfeldt, and it is identical with 6. a specimen in the U. S. National Museum determined and labeled by Lord Walsingham, *G. glochinella* Zeller, the description and figure of which also agree well with the specimens before me.

This species will be treated later under *Phthorimaca* Meyrick (p. 821), while the *similiella* Chambers=*piscipellis* Zeller should stand as *Paltodora*.

It is of value to note Chambers's suspicion¹ that he had two species mixed, as well as his note² that his *Gelechia ciliatiledella*, which undoubtedly is a *Paltodora* species (p. 780), is only microscopically distinguishable from his "*Gelechia solaniella*," that is *similiella*.

It is a good species distinct from all at present described species nearest to *pallidella* Chambers, with which species it has the white-tipped scales in common.

Similiella was described from Kentucky, and Chambers's type in U. S. National Museum is from Texas, which is also the locality of Zeller's type of *piscipellis*.

Specimens in poor condition which I take to be this species were reared from flower heads of sunflower at the Insectary of U. S. Department of Agriculture, received from Mr. E. E. Bogue, Oklahoma.

This species has vein 6 and 7 of hindwing not only connate but in fact shortstalked.

PALTODORA TOPHELLA Walsingham.

Cleodora tophella WALSINGHAM, Insect Life, I, 1888, p. 83.—RILEY, Smith's List Lep. Bor. Am., No. 5519, 1891.

Paltodora tophella BUSCK, Dyar's List Amer. Lep., No. 5549, 1903.

U. S. National Museum possesses cotype, received from Lord Walsingham; also specimen collected at Beulah, New Mexico, 8,000 feet elevation by Prof. T. D. A. Cockerell.

Habitat.—California, New Mexico.

Veins 6 and 7 in hindwings are connate.

PALTODORA PALLIDELLA Chambers.

Cleodora pallidella CHAMBERS, Can. Ent., VI, 1874, p. 245; Bull. U. S. Geol. Surv., IV, 1878, pp. 92, 135.—WALSINGHAM, Insect Life, I, 1888, pp. 81, 82.—

RILEY, Smith's List Lep. Bor. Am., No. 5515, 1891.

Paltodora pallidella BUSCK, Dyar's List Amer. Lep., No. 5550, 1903.

¹ Bull. U. S. Geol. Sur., III, p. 143.

² Can. Ent., VI, p. 242.

As remarked by Lord Walsingham, it is evident that Chambers, when he amended and elaborated his first description had more than one species before him, and some of his statements are in direct contradiction to the original description.

I believe, from careful comparison with all the material at my disposal, that he had specimens of *maguella* Busck and *dietziella* Busck mixed up with his original species.

The only authentic type from Chambers in existence is the one mentioned by Lord Walsingham (but not known to him) in Miss Murtfeldt's collection. That is now in Professor Fernald's possession, and I have had the opportunity to examine it.

It is a plain looking, grayish yellow species with white-tipped scales, similar to those of *similiella* Chambers (*piscipellis* Zeller, p. 779) and *tophella* Walsingham., very near to the latter, but smaller, and of a lighter, more yellowish ground color.

I have recognized an identical specimen in the U. S. National Museum and in Dr. Dietz's collection from Colorado.

This type specimen bears Chambers' label and agrees well with his original rather meager description, but does not agree with his later detailed description of the supposed same insect. It is obviously, under the circumstances, proper to disregard these latter amendments which evidently applied to one or more distinct species, and to retain the name *pallidella* for the pale, nearly unmarked species represented by the unique type in Professor Fernald's collection.

Veins 6 and 7 of hindwing are closely approximated.

PALTODORA MODESTA Walsingham.

Cleodora modesta WALSINGHAM, Insect Life, I, 1888, p. 82.—RILEY, Smith's List Lep. Bor. Am., No. 5517, 1891.

Paltodora modesta BUSCK, Dyar's List Amer. Lep., No. 5551, 1903.

Cotypes and other specimens of this small inconspicuous species from Los Angeles, California, are in the U. S. National Museum.

Hindwings with veins 6 and 7 connate.

SITOTROGA Heinemann.

Plate XXVIII, fig. 3.

Sitotroga HEINEMANN, Schmiett. Deutschland und Schweiz, 1870, p. 287.

Basal joint of antennae with long pecten. Labial palpi with second joints rough beneath; terminal joint longer than second, slender, pointed. Forewings very long, narrow, pointed, with 12 veins, 7 and 8 out of 6. Hindwings narrower than forewing, elongate trapezoidal, apex much produced, termen emarginate; 8 veins, 6 and 7 stalked; 2, 3, 4, and 5 remote parallel. Only the one cosmopolitan species is known.

SITOTROGA CEREALELA Olivier.

Sitotroga cerealella STAUDINGER and REBEL, Cat. Lep. Eur., II, No. 2902, 1901.—DIETZ, Smith's List Ins. N. Jersey, 1900, p. 475.—BUSCK, Dyar's List Amer. Lep., No. 5552, 1903.

Anacampsis cerealella GLOVER, U. S. Dept. Agr. Report, 1854, p. 67, pl. iv.

Gelechia cerealella CLEMENS, Proc. Phil. Acad., 1860, p. 168; Stainton ed. No. Am. Tin, 1872, pp. 112, 224.—PACKARD, Guide Study Ins., 1869, p. 350.—CHAMBERS, Bull. U. S. Geol. Surv., 1878, IV, p. 142.—RILEY, Smith's List Lep. Bor. Am., No. 5335, 1891.

This common species, the Angoumois moth, is often of economic importance on account of the injuries of the larva to stored grain.

I have not attempted to give the very numerous references to the economic literature of the species.

AUTONEDA, new name.

Plate XXVIII, fig. 4.

Neda CHAMBERS, Can. Ent. VI, 1874, p. 243.

The name *Neda* being preoccupied in the Coleoptera, I propose the above modification to signify the genus which Chambers described¹ with *plutella* as type.

It has the following characters: Labial palpi, like those in *Ypsolophus*; second joint with large, dense, projecting tuft on under side; terminal joint erect, pointed, as long as second joint; forewings narrow, nearly lanceolate; 12 veins; veins 7 and 8 stalked to costa; 6 separate, but very approximate to 7; hindwings under I; apex produced termen emarginate; 8 veins, all separate; 6 and 7 somewhat approximate; 5 nearer 6 than 4.

At present only the one species is known.

AUTONEDA PLUTELLA Chambers.

Neda plutella CHAMBERS, Can. Ent., 1874, p. 244; Can. Ent., VII., 1875, p. 105; Bull. U. S. Geol. Surv., 1878, IV., p. 157.—RILEY, Smith's List Lep. Bor. Am., No. 5521, 1891.

Autoneda plutella BUSCK, Dyar's List Amer. Lep., No. 5553, 1902.

Type.—No. 468, U.S.N.M., with Chambers' label on the pin, agrees with his unusually accurate and complete generic and specific descriptions, and is identical with other types, also labeled by Chambers himself, in the Museum of Comparative Zoology at Cambridge. One of these bears Lord Walsingham's blue label, No. 979, corresponding with his identification in his notebook,² *Neda plutella*.

These types all undoubtedly represent this interesting species.

They are all from Kentucky.

¹Can. Ent., VI, 1874, p. 243.

²Mentioned on p. 768.

GLAUCE Chambers.

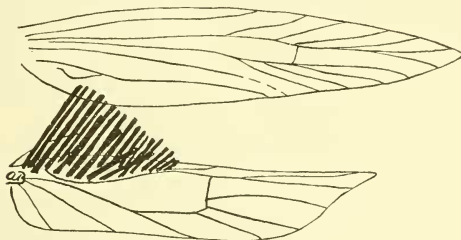
Glauce CHAMBERS, Can. Ent., VII, 1875, p. 11.

Labial palpi long, recurved, overarching the vertex; second joint slightly thickened with scales; terminal joint nearly as long as second, pointed.

Forewings elongate ovate, pointed; 12 veins, 7 and 8 out of 6; hindwings nearly as broad as forewings, trapezoidal; apex produced, pointed; termen sinuate; 8 veins, 6 and 7 stalked, 3 and 4 separate, 5 nearest 4; the costal margin from base to the middle is armed with a row of large, stiff, sharp, two-edged bristles.

Only the following species is known:

GLAUCE PECTENALÆELLA Chambers.



VENETIAN OF GLAUCE PECTENALÆELLA—CHAMBERS.

Glauce pectenallæella CHAMBERS, Can. Ent., VII, 1875, p. 12; Bull. U. S. Geol. Surv., IV, 1878, p. 148; Journ. Cinn. Soc. Nat. Hist., II, 1880, p. 203, fig. 22.—RILEY, Smith's List Lep. Bor. Am., No. 5291, 1891.—BUSCK, Dyar's List Amer. Lep., No., 5642, 1903.

This characteristic species, all authentic material of which is lost, I have recently recognized beyond doubt among *Tineinae* collected by the writer at light in the District of Columbia and in the neighborhood of Covington, Kentucky.

Chambers's description and figure of the wing is essentially correct, except that he has made vein 6 in forewing out of vein 7, instead of 7 and 8 out of 6, an easily explained error.

Chambers's type came from Texas.

TELPHUSA Chambers.

Plate XXVIII, fig. 5.

Telphusa CHAMBERS, Can. Ent., IV, 1872, p. 182;
Xenotechia MEYRICK, Handbook Brit. Lep., 1895, p. 583.

Chambers erected this genus for his species *curvistrigella*, the unique type of which is still in the Museum of Comparative Zoology in Cambridge, with Chambers' label on the pin, and recognizable, though in poor condition.

Chambers shortly afterwards gave up this genus and included his species in *Gelechia* as a synonym of Clemens's *Gelechia longifasciella*, but a name is needed to signify the genus, which Chambers can hardly be said to have defined, but which has the following characters in common with *curistrigella*. Chambers' name must stand in preference to Meyrick's later name *Xenolechia*.

I strongly suspect that Chambers' genus, *Adrasteia*, is synonymous with the present genus, in which case that name would supplant *Telphusa*, but for the time being it must be left as "unrecognized." The types of the two species, *Adrasteia alexandrixella* and *A. fasciella*,¹ on which Chambers erected the genus, are lost, and though I feel rather certain that I have recognized both species as belonging to *Telphusa*, still altogether insufficient collecting has been done in Kentucky, from where these species are described, to warrant final conclusions from the limited material on hand, and at present I must leave both genus and species as unrecognized. There is no way to include the genus in any table, as Chambers did little more than attach the name to those two species without further specification; the only tangible generic character given is the tufted forewings.

Telphusa has the following characters: Second joint of labial palpi thickened with rough scales beneath, terminal joint slender pointed.

Forewings elongate pointed, 12 veins, 7 and 8 stalked, 6 separate or out of 7 near base; hindwings trapezoidal, apex pointed termen sinuate, as broad or broader than the forewings; 8 veins, 6 and 7 stalked, 3 and 4 separate, 5 nearest 4. Forewings often with tufts of raised scales.

The American species at present recognized as belonging to this genus may be separated by the following table:

With oblique light fascia at basal fourth of forewings	1
Without such light fascia	2
1. Forewings with apical half of dorsal edge white.....	<i>longifasciella</i> , p. 785
Dorsal edge not white	<i>latifasciella</i> , p. 783
2. Ground color of forewings white	3
Ground color not white.....	5
3. Markings on forewings black.....	4
Markings fawn colored	<i>betulella</i> , p. 787
4. With complete black fascia crossing forewings	<i>basistrigella</i> , p. 787
Black fascia not reaching dorsal edge	<i>basifasciella</i> , p. 787
5. Wings very dark fuscous, nearly black	<i>quinquecirstatella</i> , p. 785
Wings lighter, gray	6
6. With oblique black streak from costa near base	7
Without such streak	8
7. Head and thorax dark fuscous.....	<i>quercinigracella</i> , p. 786
Head and thorax light brownish.....	<i>palliderosacella</i> , p. 786
8. Forewings with raised scales.....	<i>querciella</i> , p. 787
Forewings without raised scales.....	9
9. With sharply defined dark spot on disc.....	<i>glandiferella</i> , p. 788
Without such spot.....	<i>belangerella</i> , p. 788

¹ Can. Ent., IV, 1872, p. 149.

TELPHUSA LONGIFASCIELLA Clemens.

Gelechia longifasciella CLEMENS, Proc. Ent. Soc. Phila., II, 1863, pp. 12, 121; Stainton, Tin. N. A., 1872, pp. 219, 223.—CHAMBERS, Can. Ent., IV, 1872, p. 174; Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5402, 1891.

Telphusa curvistrigella CHAMBERS, Can. Ent., IV, 1872, p. 133.

Gelechia obliquifasciella CHAMBERS, Journ. Cinn. Soc. Nat. Hist., II, 1879, p. 182.—RILEY, Smith's List Lep. Bor. Am., No. 5421, 1891.

Telphusa longifasciella BUSCK, Dyar's List Amer. Lep., No. 5554, 1902.

Chambers dropped *curvistrigella* as a synonym of Clemens's *longifasciella*.

In the Museum of Comparative Zoology in Cambridge are types of *curvistrigella* and *obliquifasciella* with Chambers's handwriting. They are identical, as the description would indicate, and Chambers has here again evidently been a victim of his own carelessness with his types.

I have met with no other specimens.

Habitat.—Texas, Kentucky.

TELPHUSA QUINQUECRISTATELLA Chambers.

Gelechia quinquecristatella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, pp. 88, 146.—RILEY, Smith's List Lep. Bor. Am., No. 5465, 1891.

Telphusa quinquecristatella BUSCK, Dyar's List Amer. Lep., No. 5555, 1903.

The specimens in the U. S. National Museum, determined by Lord Walsingham as *Gelechia quinquecristatella* Chambers, agree with Chambers's description and undoubtedly represent this species.

I am unable to distinguish it from authentic specimens (unfortunately poor) of the European (*Xenolechia*) *æthiops* Westwood, and I sent specimens to Dr. E. Meyrick, who also identified it as this species.

However, the European food-plant of *æthiops*, *Erica cinerea*, does not grow wild in this country, and until the species has been bred here there is a possibility that it is another, closely related species, and it will be safer to retain it as such until then; but the imagos are surely very similar.

Habitat.—Eastern United States.

TELPHUSA LATIFASCIELLA Chambers.

Gelechia latifasciella CHAMBERS, Cinn. Quart. Jour., II, 1875, p. 251; Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5399, 1891.

Telphusa latifasciella BUSCK, Dyar's List Amer. Lep., No. 5556, 1903.

I have examined types in Professor Fernald's collection and in the Museum of Comparative Zoology in Cambridge. In the National Museum are specimens received from Miss Murtfeldt, who writes that she has bred both the light and the dark forms from similar larvæ

in rolled leaves of oak. I have taken a few specimens from around Washington, District of Columbia.

Habitat.—Kentucky, Missouri.

TELPHUSA QUERCINIGRACELLA Chambers.

Gelechia quercinigracella CHAMBERS, Can. Ent., IV, 1872, p. 170.

Gelechia (*Pocilia*?) *fragmentella* ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 71.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 143.—RILEY, Smith's List Lep. Bor. Am., No. 5365, 1891.

Gelechia quercinigracella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 146.—RILEY, Smith's List Lep. Bor. Am., No. 5460, 1891.

Telphusa quercinigracella BUSCK, Dyar's List Amer. Lep., No. 5557, 1903.

Placed by mistake among the types of *Gelechia* (*Recurvaria*) *quercivorella* Chambers in the Museum of Comparative Zoology in Cambridge, and therefore omitted in Hagen's list of types¹, I found a specimen differing from the others and labeled in Chambers's handwriting *G. quercinigracella*.

This specimen agrees perfectly with Chambers's description, and without doubt represents this species. It is, so far as I know, the only authentic specimen of this species from Chambers in existence.

It is, as the descriptions would indicate, identical with Zeller's type of *fragmentella*, also found in the Museum of Comparative Zoology. Both are females.

In the U. S. National Museum there is a good series of this species bred by the writer from larvæ on oak, agreeing well with Chambers's description of the larva.

Habitat.—Texas, Kentucky, District of Columbia, and New York.

TELPHUSA PALLIDEROSACELLA Chambers.

Gelechia (*Ergatis*) *palliderosacella* CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, pp. 90 and 145.—WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 180.—RILEY, Smith's List Lep. Bor. Am., No. 5440, 1891.

Telphusa palliderosacella BUSCK, Dyar's List Amer. Lep., No. 5558, 1903.

In the U. S. National Museum there are specimens determined by Lord Walsingham which I believe truly represent this species. I have received similar specimens from Miss Murtfeldt under that name, which agree with Chambers's description.

Food plant.—Oak.

Habitat.—Texas, Missouri, District of Columbia, Pennsylvania, and New York.

What has been supposed to be a type of *palliderosacella* with Chambers's label on the pin is found in the Museum of Comparative Zoology in Cambridge, but it does not agree with his description and some mistake has obviously been made; it is a much rubbed *Aristotelia* of the *roseosuffusella* group.

¹ Papilio, IV, 1884, p. 98.

TELPHUSA QUERCIELLA Chambers.

Depressaria querciella CHAMBERS, Can. Ent., IV, 1872, pp. 127, 147.

Adrastra querciella CHAMBERS, Can. Ent., IV, 1872, p. 207.

Gelechia querciella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 146.—RILEY, Smith's List Lep. Bor. Am., No. 5463, 1891.—DIETZ, Smith N. J. Insects, 1900, p. 474.

Telphusa querciella BUSCK, Dyar's List Amer. Lep., No. 5559, 1903.

Type No. 460, U.S.N.M., of this species, agrees with other specimens from Chambers in Professor Fernald's collection and in the Museum of Comparative Zoology in Cambridge. I have met with no other specimen.

Food plant.—Oak (Chambers).

Habitat.—Kentucky, New Jersey.

TELPHUSA BASISTRIGELLA Zeller.

Gelechia (Pacilia?) basistrigella ZELLER, Verh. k. k. zool.-bot. Gesellsch. Wien, 1873, p. 270, pl. LV, fig. 23.

Gelechia basistrigella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1870, p. 141.—RILEY, Smith's List Lep. Bor. Am., 5318, No. 1891.

Telphusa basistrigella BUSCK, Dyar's List Amer. Lep., No. 5560, 1903.

The unique type of this species is in the Museum of Comparative Zoology in Cambridge in good condition. I have not seen other specimens which I can refer with certainty to this species.

Habitat.—Texas.

TELPHUSA BASIFASCIELLA Zeller.

Gelechia (Pacilia) basifasciella ZELLER, Verh. k. k. zool.-bot. Gesellsch. Wien, 1873, p. 269, pl. III, fig. 22.

Gelechia basifasciella CHAMBERS, Bull. U. S. Geol. Surv., IV., 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5319, 1891.—DIETZ, Smith's List Insects N. J., 1900, p. 474.

Telphusa basifasciella BUSCK, Dyar's List Amer. Lep., No. 5561, 1903.

I have examined the types of this easily recognized species in the Museum of Comparative Zoology in Cambridge. In the U. S. National Museum there is a specimen identical with these determined by Lord Walsingham.

Habitat.—Texas, New Jersey (Dietz).

TELPHUSA BETULELLA, new species.

Telphusa betulella BUSCK, Dyar's List Amer. Lep., No. 5562, 1903.

Antennæ $\frac{3}{5}$, simple, slightly serrate toward tip, light reddish, with base of each joint silvery white and tip of each joint dark brown.

Labial palpi, second joint thickened, with rough scales beneath, silvery white slightly sprinkled with drap scales and with base drap; terminal joint suffused with drap and black scales, a small spot on the inner side near the middle and the extreme tip whitish. Face and

head light silvery drap, thorax a shade darker. Forewings silvery white suffused irregularly with drap scales, especially below fold and in the apical part; extreme base of costa black; at middle of wing a small dark drap costal spot; near base of wing, just below costa, a large tuft of raised scales; on middle of fold, at end of disk and beyond disk, are similar smaller tufts of raised scales, not very conspicuous and of the general color of the wing, white and drap mixed.

In apical part and at base of the cilia a few scattered black scales; cilia whitish.

Hindwing light silvery gray, cilia golden white. Abdomen and legs golden white, slightly sprinkled with drap. Venation typical; veins 6 and 7 in hindwing very shortly stalked.

Alar expanse.—12 to 13 mm.

Habitat.—District of Columbia, Virginia.

Food plant.—*Betula nigra*.

Type.—No. 6348, U.S.N.M.

Described from several specimens bred in March, 1884, by Mr. Th. Pergande, and in August, 1899, by the writer.

The larvæ are leaf rollers on black birch and pupate in the leaf. Imago appear during August and another brood overwinters as pupa, producing adults in early spring.

TELPHUSA BELANGERELLA Chambers.

Gelechia belangerella CHAMBERS, Can. Ent., VII, 1875, p. 210; Bull. U. S. Geol.

Surv., IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5320, 1891.

Gelechia (Teleia) oronella WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 179.

Gelechia oronella PACKARD, Fifth Rep. U. S. Ent. Comm., 1890, p. 630.—RILEY, Smith's List Lep. Bor. Am., No. 5436, 1891.

Gelechia orella DIETZ, Smith's List Ins. N. Jersey, 1900, p. 474.

Telphusa belangerella BUSCK, Dyar's List Amer. Lep., No. 5563, 1903.

The unique well-preserved type of *Gelechia belangerella* was obtained from Laval University, Quebec, and is now in the U. S. National Museum under type No. 5767. In that collection are also specimens compared by the writer with Walsingham's type of *Gelechia oronella* in Professor Fernald's collection.

As the description would indicate the two species are identical. Chambers name must stand. Larva is leaf roller on alder (Packard).

Habitat.—Eastern United States, Canada.

TELPHUSA GLANDIFERELLA Zeller.

Gelechia (Anacampsis) glandiferella ZELLER, Verh. k. k. zool.-bot. Gesellsch. Wien, XXIII, 1873, p. 275, pl. iv, fig. 25.

Gelechia sella CHAMBERS, Can. Ent., VI, 1874, p. 238.

Gelechia glandifuella CHAMBERS, Can. Ent., IX, 1877, p. 14.

Gelechia glandifera CHAMBERS, Can. Ent., IX, 1877, p. 24.

Gelechia glandiferella CHAMBERS, U. S. Geol. Surv. Bull., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5382, 1891.

Xenolechia glandiferella WALSINGHAM, Proc. Zool. Soc. London, 1897, p. 72.

Telphusa glandiferella BUSCK, Dyar's List Amer. Lep., No. 5564, 1903.

In the U. S. National Museum are types of both Zeller's and Chambers's species. I have also examined the types of both in the Museum of Comparative Zoology. They all represent the form figured by Zeller, with the large wing spot reaching down to the dorsal edge.

Chambers mentioned a variety in which this spot is represented by a triangular spot on the fold, not reaching the margin. This supposed variety is also represented in the National Museum, labeled by Lord Walsingham *Gelechia glandiferella*. I am inclined to believe it a quite distinct species, but until its life history is known it may remain under the present species.

Riley made *pallidocherella* Chambers a synonym of this species, but, as I have shown,¹ this is a mistake. Chambers described only two species as *pallidocherella*, the one is type of *Helice* [p. 804], and probably is the one confounded with the above; the other is a *Gnorimoschema* [p. 828].

AGNIPPE Chambers.

Plate XXVIII, figs. 6-7.

Agnippe CHAMBERS, Can. Ent., IV, p. 194.

Labial palpi long curved; second joint slightly thickened, with rough scales beneath toward apex, terminal joints smooth pointed, nearly as long as second.

Forewings elongate ovate, pointed; 10 or 11 veins; vein 11 absent; vein 5 absent or out of 4, 7 and 8 out of 6. Hindwings slightly broader than forewings; trapezoidal apex pointed; termen sinuate; 7 veins, 6 absent; 2, 3, 4, and 4 separate, equidistant; cell open between 5 and 7.

Only two species are at present recognized, which may be separated thus:

Vein 5 in forewing, present; head brownish, *biscolorella*, p. 789.

Vein 5 in forewing, absent; head white, *fuscopulvella*, p. 790.

AGNIPPE BISCOLORELLA Chambers.

Agnippe biscolorella CHAMBERS, Can. Ent., IV, 1872, p. 195; V, 1873, p. 230; VII, 1875, p. 106; IX, 1877, p. 231; Bull. U. S. Geol. Surv., IV, 1878, p. 128.—

RILEY, Smith's List. Lep. Bor. Am., No. 5296 [part], 1891.—BUSCK, Dyar's List. Amer. Lep., No. 5567, 1903.

Type No. 442, in the U. S. National Museum, of the species, is identical with type in Professor Fernald's collection and types in the Museum of Comparative Zoology, and agrees perfectly with Chambers's generic and specific description.

¹ Journ. New York Ent. Soc., X, 1902, p. 93.

The synonymy with the following species, which Chambers himself suggested, will not stand as explained under that species.

Food plant.—Chambers surmised¹ that this species fed in some way on *Gleditschia tricanthos* (honey locust), but nothing definitely is known of the early stages.

Habitat.—Kentucky.

AGNIPPE FUSCOPULVELLA Chambers.

Agnippe fuscopulvella CHAMBERS, Can Ent., IV, 1872, p. 195.—BUSCK, Dyar's List Amer. Lep., No. 5568, 1903.

Agnippe biscolorella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 128.

Agnippe biscolorella var. *fuscopulvella* RILEY, Smith's List Lep. Bor. Am., No. 5296a, 1891.

Though at first recognizing this as a distinct species, Chambers was led later by the superficial similarity to make it a synonym of the foregoing species.

In the U. S. National Museum, however, is, besides the type of *biscolorella*, another specimen received from Chambers at the same time as this. It is in Chambers's mounting and furnished with an identical small label and the number 7, as is found on the pin of *biscolorella*. But it is a different, though very similar insect, which agrees well with Chambers's description of *fuscopulvella*, and which I feel confident is the original type of that species. This view was substantiated during a study of Chambers's types in the Museum of Comparative Zoology in Cambridge, where types of both species, correctly named by Chambers himself, were found.

A superficial examination might bring the conclusion, as it did to Chambers, that *fuscopulvella* is a worn specimen, or a variety of *biscolorella*, but when closely examined it is easily seen that the dirty whitish ground color in *fuscopulvella*, which gives the appearance of a worn wing, really is intact and suits Chambers's description of *fuscopulvella* well.

And a study of the venation will show that though very similar to that of *biscolorella* it differs in lacking vein 5 on the forewings.

All other points in venation, form of wing, and palpi are identical with those of the type of the genus, the definition of which I have therefore only widened in that one respect.

Habitat.—Kentucky.

NEALYDA Dietz.

Plate XXVIII, fig. 8.

Nealyda DIETZ, Ent. News, XI, 1900, p. 350; Proc. U. S. Nat. Mus., XXIII, 1900, p. 228.

Labial palpi moderate, curved, ascending, smooth, second joint

¹ Can Ent., IX, p. 231.

slightly thickened with appressed scales; terminal joint shorter than second, also somewhat thickened with scales, pointed. Forewings ovate, pointed, with very heavy scaling, making them appear proportionately broader; 12 veins, 7 and 8 stalked. Hindwings under I, trapezoidal; apex produced; termen so deeply emarginate as to make wing bilobed; 6 veins, 5 and 6 absent, 7 to apex cell open between 4 and 7.

The larvæ are leaf miners; they are flattened, suggesting *Lithocolletis* larvæ of the flat type; abdominal legs on segments 7–10 long, thin, with globular swelling at the end; no anal feet; they pupate in flat cocoons outside the mine.

Only three species are at present known, but that more remain to be discovered is proven by the supposed type of *Gelechia grisse fasciella* Chambers, in the Museum of Comparative Zoology in Cambridge, which is an undescribed species of *Nealyda*.

The described species may be separated as follows:

1. Dark fascia sharply defined on both sides.....*pisoniæ*, p. 791
2. Dark fascia not sharply defined toward the base of wing..... 3
3. Labial palpi dark; both joints tipped with white.....*bifidella*, p. 791
- Labial palpi light, not tipped with white.....*kinzelella*, p. 792

NEALYDA PISONIÆ Busck.

Nealyda pisoniæ BUSCK, Proc. U. S. Nat. Mus., XXIII, 1900, p. 229, pl. 1, fig. 5.—DYAR, Proc. Wash. Ent. Soc., IV, 1901, p. 470.—BUSCK, Dyar's List Amer. Lep., No. 5569, 1902.

Types of male and female are found in the U. S. National Museum (No. 4935).

Larva makes large trumpet-formed upper mine in leaves of *Pisonia aculeata*.

Habitat.—Palm Beach, Florida.

NEALYDA BIFIDELLA Dietz.

Nealyda bifidella DIETZ, Ent. News, XI, 1900, p. 351, pl. 1, fig. 2.—BUSCK, Proc. U. S. Nat. Mus., XXIII, 1900, p. 228.—DYAR, Proc. U. S. Nat. Mus., XXV, 406, 1902.—BUSCK, Dyar's List Amer. Lep., No. 5570, 1903.

In the U. S. National Museum is a cotype received from Dr. Dietz; also a large series of perfect specimens bred by Dr. Dyar and the writer from material collected by Dr. Dyar at Salida, Colorado, in July, 1901.

The larva works as leaf miner in the identical manner as the two other species, and has the same strange form and development of the abdominal legs; anal legs absent.

Food plant.—*Allionia nictaginea*.

Habitat.—Colorado.

NEALYDA KINZELELLA Busck.

Nealyda kinzelella Busck, Proc. U. S. Nat. Mus., XXIII, 1900, p. 230; Dyar's List Amer. Lep., No. 5571, 1903; DYAR, Proc. Ent. Soc. Washington, IV, p. 471, 1901.

Types are in U. S. National Museum (No. 4936).

Larva is leaf miner on *Pisonia obtusata*.

Habitat.—Palm Beach, Florida.

CHRY SOPORA Clemens

Plate XXIX, fig. 9.

Chrysopora CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 362.

Nomia CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 167.

Namodia HEINEMANN, Schmetterlinge Deutschland und der Schweiz, 1870, p. 284.

Labial palpi moderate, curved smooth, thin pointed, terminal joint shorter than second joint. Forewings narrow, ovate, pointed; 12 veins, 7 and 8 stalked, 6 separate. Hindwing under I; apex greatly produced; hind margin deeply and circularly excavated beneath it and anal angle rounded; 7 veins, 6 absent, cell not closed, 5 nearly obsolete approximate to 4, 3 and 4 separate.

This genus, of which *lingulacella* Clemens is the type, seems a development from *Aristotelia*, and forms an interesting step toward the extreme form of hindwings as found in the foregoing genus *Nealyda* Dietz.

The larvæ, as far as known, are leaf miners on *Atriplex* and *Chenopodium*.

Only the following two species are at present recognized from America:

With uninterrupted silvery fascia before middle of forewing *hermanella*, p. 793
 Silvery fascia interrupted at the fold *lingulacella*, p. 792

CHRY SOPORA LINGULACELLA Clemens.

Nomia lingulacella CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 167; Stainton Ed. Nor. Am. Tin., 1872, p. 124.

Chrysopora lingulacella CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 362; Stainton Ed. Nor. Am. Tin., 1872, p. 158.—Busck, Dyar's List Amer. Lep., No. 5572, 1903.

Gelechia hermanella CHAMBERS, Can. Ent., IV, 1872, pp. 67 and 169; Ent. Mo. Mag., XI, 1875, p. 279; Bull. U. S. Geol. Surv., IV, 1878, pp. 117 and 144; Can. Ent., X, 1878, p. 52.—RILEY, Smith's List Lep. Bor. Am., No. 5393, 1891.

Chrysopora lingulacella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 134.

Gelechia hermonella CHAMBERS, Can. Ent., IV, 1878, p. 173.

Gelechia armeniella FREY and BOLL, Stett. Ent. Zeit., XXXIX, 1878, p. 249.—RILEY, Smith's List Lep. Bor. Am., No. 5314, 1891.

Clemens's type of this species is lost, but there is no difficulty in identifying this striking insect from his careful description.

It is the same species which Chambers, judging from Stainton's figure of that species, persistently but wrongfully identified as *hermanella* Fabricius, although he himself noticed several differences from this European species, both in the larva and in the imago.

The similar life mode and the common food plant of these two species, together with the great resemblance in coloration, made this mistake very natural.

Frey, who was acquainted with the European *hermanella* in nature, distinguished between the two and described the American species as *Gelechia armeniella*, not recognizing that it had already been described by Clemens, a fact which Chambers afterwards realized and brought out in his index, still, however, clinging to his belief that it was nothing but a variety of *hermanella*.

Chambers, writing on this species, said that he first found the true *hermanella* at Lake Michigan, and afterwards what he called the variety in Kentucky. This may be possible, but all evidence indicates that he was mistaken in his first determination, and that it was *Chrysopora lingulacella* bred from *Chenopodium album*. His notes on differences in larva and imago from Stainton's figure of *hermanella* indicate this.

In all events, I have examined all existing specimens, determined by Chambers in the United States National Museum, in the Museum of Comparative Zoology in Cambridge, and in Professor Fernald's collection. They are all alike and represent Clemens's species.

Food plant.—*Chenopodium* and *Atriplex*.

Habitat.—Michigan, Kansas, Kentucky, Missouri, Pennsylvania, District of Columbia.

CHRYSOPORA HERMANELLA Fabricius.

Pinca hermanella FABRICIUS, Species Insectorum, II, 1781, p. 509.

Chrysopora hermanella STAUDINGER and REBEL, Cat. Lep. Eur., II, No. 2896, 1901.—

BUSCK, Dyar's List Amer. Lep., No. 5573, 1903.

I have seen only a single specimen of this species from America; the one sent me for determination from Laval University, Quebec, Canada. The U. S. National Museum contains a fine series of European specimens.

LEUCE Chambers.

Plate XXIX, fig. 10.

Nera CHAMBERS, Can. Ent., VII, 1875, p. 9.

Leuce CHAMBERS, Can. Ent., VII, 1875, p. 51.

Labial palpi rather short, second joint thickened with large tuft beneath; terminal joint shorter than second, thickened with appressed scales, blunt. Forewings elongate, ovate, pointed; 12 veins, 7 and 8 stalked, 3 and 4 connate from corner of cell, 2 distant, long; with tufts of raised scales. Hindwing less than I trapezoidal, apex produced,

termen sinuate, anal angle rounded; 8 veins, 6 and 7 parallel, 3 and 4 closely approximate, 5 nearest 4.

The genus was placed by Riley in the Laverniæ in Smith's List Lep. Bor. Am., probably on account of Chambers's mistake in redescribing the type as *Laverna fuscocristatella*. This, however, Chambers himself corrected, and his description as well as his types prove that it belongs to the *Gelechiidæ*. Only the one species is at present recognized.

LEUCE FUSCOCRISTATELLA Chambers.

Nera fuscocristatella CHAMBERS, Can. Ent., VII, 1875, p. 9; Bull. U. S. Geol. Surv., IV, 1873, p. 157.

Laverna fuscocristatella CHAMBERS, Can. Ent., VII, 1875, p. 34.

Leuce fuscocristatella CHAMBERS, Can. Ent., VII, 1875, p. 51.—RILEY, Smith's List Lep. Bor. Am., No. 5740, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5574, 1903.

Anarsia (?) *belfragesella* CHAMBERS, Journ. Cinn. Soc. Nat. Hist., II, 1879, p. 183.—RILEY, Smith's List Lep. Bor. Am., No. 5542, 1891.

Type No. 495 in the U. S. National Museum of *Nera fuscocristatella* is identical with the type of this species in Professor Fernald's collection and types in the Museum of Comparative Zoology.

They agree well with the description, and are all authenticated by Chambers's handwriting on the labels.

Anarsia ? *belfragesella* is another name for this species, as Chambers's descriptions and his authentic type in the museum in Cambridge prove.

All of these types are from Texas. I have met with no other specimen.

ARISTOTELIA Hübner.

Plate XXIX, fig. 11.

Aristotelia HÜBNER Verz. bek. Schm., 1818, p. 424.

Eucatoptus WALSHINGHAM, Proc. Zool. Soc. Lond., 1897, p. 69.

Labial palpi long, slender, curved; second joint thickened with appressed scales, somewhat roughened beneath; terminal joint long, smooth, pointed.

Forewings narrow, elongate, pointed; 12 veins, 7 and 8 stalked. Hindwings as broad or nearly as broad as forewings, elongate trapezoidal, apex produced, pointed, termen emarginate; 8 veins, all separate, 3, 4, and 5 remote from each other, 6 and 7 parallel.

Lord Walsingham has separated,¹ under the generic name *Eucatoptus*, such species of this genus in which the males have a costal hair pencil from base of hindwing. I can not, however, believe that this is a good generic character and that *Eucatoptus* should be retained as

¹Proc. Zool. Soc. Lond., 1897, p. 69.

a good natural genus. That character¹ is found in several genera, and very closely allied species are found differing in the presence or absence of this hair pencil, while others, evidently farther apart, would go together on account of the possession of it.

Miss Murtfeldt's species *Eucatoptus striatella*,² however, can not be included in that genus, and consequently not in the present, as it has veins 3 and 4 in hindwings connate and also differs in palpal characters. It belongs to Meyrick's recent genus *Phthorimæa*, under which it will be treated.

Of the species included in *Aristotelia* by Dr. Dietz,³ *pinifoliella* Chambers will be found treated under *Paralechia* Busck, *attributella* under *Epithectis* Meyrick, and *dorsivittella* under *Recurraria* Haworth.

The species at present recognized belonging to this genus may be separated thus:

Forewings, unicolorous, or nearly so	1
Forewings, not unicolorous	7
1. Ground color light, white, or yellowish	2
Ground color dark, black, or fuscous	5
2. Forewings with five black discal dots	<i>quinquepunctella</i> , p. 804
Forewings without such five dots	31
3. With light yellow costal streak at beginning of cilia	4
Without such streak	<i>disconotella</i> , p. 802
4. Tip of terminal joint of labial palpi black	<i>kearfottella</i> , p. 803
Tip of labial palpi not black	<i>gilcoliniella</i> , p. 803
5. Antennæ with fifth and tenth apical joint white above	<i>absconditella</i> , p. 801
Antennæ without white joints	6
6. Face creamy yellow	<i>physaliella</i> , p. 802
Face dark	<i>minimella</i> , p. 802
7. With metallic markings	8
Without metallic markings	10
8. Basal two-thirds of forewing light yellow	<i>cockerella</i> , p. 800
Basal two-thirds of forewing not yellow	9
9. With row of black discal dots	<i>elegantella</i> , p. 799
Without such row of dots	<i>argentifera</i> , p. 800
10. Forewings with dark fascia at apical third	11
Without such fascia	12
11. Head and thorax light yellow	<i>bifasciella</i> , p. 799
Head and thorax dark	<i>molestella</i> , p. 797
12. Forewings more or less roseate	13
Forewings not roseate	<i>iva</i> , p. 799
13. With pure white costal markings	<i>rosceusuffusella</i> , p. 796
Without pure white costal markings	14
14. Males with costal hair pencil at base of hindwing	<i>rubidella</i> , p. 798
Males without such hair pencil	5
15. Extreme apex of third joint of labial palpi black	<i>pubibundella</i> , p. 796
Apex not black	<i>fungicorella</i> , p. 798

¹This hair pencil is of an entirely other and less important nature than the one found in the genus *Phthorimæa* Meyrick (p. 821), where the wing itself is modified for its reception.

²Can. Ent., XXXII, 1900, p. 163.

³Smith's List of New Jersey Insects, 1900.

ARISTOTELIA ROSEOSUFFUSELLA Clemens.

- Gelechia roseosuffusella* CLEMENS, Proc. Acad. Nat. Sci. Phila., XII, 1860, pp. 162, 434; Proc. Ent. Soc. Phila., II, 1863, p. 121; Proc. Ent. Soc. Phila., III, 1864, p. 508; Stainton Ed. Tin. N. Am., 1872, pp. 40, 113, 225, 262.—CHAMBERS, Can. Ent., IV, 1872, pp. 69, 148, 169, 193; Bull. U. S. Geol. Surv., III, 1877, pp. 125, 141; Can. Ent., IX, 1877, p. 14; Bull. U. S. Geol. Surv., IV, 1878, pp. 110, 146; Journ. Cinn. Soc. Nat. Hist., II, 1880, p. 183.—MURTFELDT, Can. Ent., VI, 1874, p. 222; Bull. U. S. Dept. Agr. Div. Ent., 1891, pp. 23, 53.—RILEY, Smith's List Lep. Bor. Am., No. 5470, 1891.
- Gelechia rosasuffusella* CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 290.
- Gelechia (Ergatis) roseosuffusella* ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1872, p. 272, pl. iv, fig. 24.—WALSINGHAM, Trans. Am. Ent. Soc., X, 1882, p. 180.
- Gelechia bellela* WALKER, Cat. Lep. Ins. Brit. Mus., XXIX, 1864, p. 595.
- Aristotelia roseosuffusella* WALSINGHAM, Proc. Zool. Soc. Lond., 1897, p. 66.—DIETZ, Smith's List N. Jers. Insects, 1900, p. 474.—BUSCK, Proc. U. S. Nat. Mus., XXIII, 1900, p. 226; Dyar's List Amer. Lep., No. 5575, 1903.

There is great need of careful observations on and breeding of this and the several closely allied species. To Miss Mary Murtfeldt is due what has been done already in this direction in this group, and without her records we should be still more at sea than now is the case.

What I provisionally, in common with Miss Murtfeldt and Lord Walsingham, take to be this species is the same as Zeller held to be *roseosuffusella*, as is shown by Zeller's authentic specimens in Cambridge and in the U. S. National Museum. It is also what Chambers and Riley thought to be the species, as is shown by the specimens determined by them. This species breeds in *Trifolium pratense* and is common all over the continent and is also found in the West Indies.

But Clemens says expressly that *roseosuffusella* feeds in the fruit panicles of sumach.¹

It is unlikely that the species has both food plants. I have endeavored during the last years to breed all Micro-lepidoptera found on sumach with this particular question in view, but have not met with any which belong in this group.

Clemens made his statement about the food plant four and a half years after his description of the insect, and has possibly made a mistake somehow; but if ever a *Gelechiid* answering his description is bred from sumach, it must of course retain Clemens's name and a new name must be provided for the *Trifolium* feeder.

In the U. S. National Museum are two specimen named by Zeller, one labeled by Chambers, and three by Lord Walsingham, besides numerous specimen from many different localities.

ARISTOTELIA PUDIBUNDELLA Zeller.

- Gelechia (Ergatis) pudibundella* ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 273.—WALSINGHAM, Trans. Am. Ent. Soc., X, 1882, p. 181.

¹ Proc. Ent. Soc. Phila., III, p. 508.

Gelechia pudibundella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 146.—RILEY, Smith's List Lep. Bor. Am., No. 5454, 1891.

Gelechia intermediella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, pp. 89, 144.—WALSINGHAM, Trans. Am. Ent. Soc., X., 1882, p. 180.—MURTFELDT, Bull. U. S. Dept. Agri. Div. Ent., 23, 1871, p. 53.—RILEY, Smith's List Lep. Bor. Am., No. 5392, 1891.

Aristotelia pudibundella WALSINGHAM, Proc. Zool. Soc. Lond., 1897, p. 66.—BUSCK, Proc. U. S. Nat. Mus., XXIII, 1900, p. 226; Dyar's List Amer. Lep., No. 5576, 1903.

Aristotelia intermediella DIETZ, Smith's List Ins., N. Jersey, 1900, p. 475.

Of this species I have examined Zeller's types in Cambridge and in the U. S. National Museum, which are alike; also a large series of moths bred from apple by Miss Murtfeldt (as *intermediella*?) and at the U. S. Department of Agriculture.

Whether Miss Murtfeldt was right in her determination of her species bred from apple as *intermediella* Chambers, and consequently Lord Walsingham's conclusion that *intermediella* is synonymous with Zeller's species, is not apparent to me. A specimen in the National Museum determined by Lord Walsingham as *intermediella* does not strengthen the theory. I believe there are several more species than now recognized, all very similar, and that differences in the larvæ will show this, when sufficient breeding has been done. I have several closely similar specimens, bred and collected, which I feel confident are new species, but I shall not attempt further description until full life histories have been worked out, as it would only make this group still more intricate. At present at least it will be necessary and convenient to relegate Chambers's poorly defined species as a synonym, according to Lord Walsingham.

Pudibundella is as widely distributed and nearly as common as *rosco-suffusella*. It is a somewhat smaller and darker species. Both species come freely to light.

Food plant.—Apple.

ARISTOTELIA MOLESTELLA Zeller.

Gelechia (Ergatis) molestella ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 274.

Gelechia molestella RILEY, Smith's List Lep. Bor. Am., No. 5412, 1891.

Aristotelia molestella BUSCK, Dyar's List Amer. Lep., No. 5577, 1903.

The unique type of this species is in Lord Walsingham's collection and I have not examined it; but the species can without question be referred to the present genus from Zeller's description, and Mr. J. H. Durrant has kindly substantiated this for me in a letter after examining the type.

I have identified without hesitation a single female specimen in fine condition, collected in the District of Columbia (Busck), as this species, from Zeller's careful description, which tallies in every detail with my specimen.

The type came from Texas (Belfrage).

ARISTOTELIA RUBIDELLA Clemens.

- Gelechia rubidella* CLEMENS, Proc. Acad. Nat. Sci. Phil., XII, 1860, pp. 163, 434; Proc. Ent. Soc. Phil., II, 1863, p. 121; Stainton Ed. Tin. N. Am., 1872, pp. 40, 115, 225.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 147.—RILEY, Smith's List Lep. Bor. Am., No. 5471, 1891.
- Gelechia rubensella* CHAMBERS, Can. Ent., IV, 1872, p. 193; Bull. U. S. Geol. Surv., IV, 1878, pp. 89, 147.—MURTFELDT, Can. Ent., VI, 1874, p. 222; Bull. U. S. Dept. Agr. Div. Ent., 23, 1891, p. 54.
- Gelechia pulibundella* CHAMBERS, Can. Ent., IX, 1877, p. 23.
- Gelechia (Ergatis) rubidella* WALSINGHAM, Trans. Am. Ent. Soc., X, 1882, p. 180.
- Eucatoptus rubidella* WALSINGHAM, Proc. Soc. Zool. Lond., 1897, p. 70.
- Aristotelia rubidella* DIETZ, Smith's List. Ins. N. Jersey, 1900, p. 475.—BUSCK, Dyar's List. Amer. Lep., No. 5578, 1903.

In the U. S. National Museum are two specimens determined by Lord Walsingham, one of which bears his blue label, No. 1188.

Habitat.—Eastern United States, West Indies. (Walsingham.)

ARISTOTELIA FUNGIVORELLA Clemens.

- Gelechia fungivorella* CLEMENS, Proc. Ent. Soc. Phila., III, 1864, p. 507; Stainton Ed. N. Am. Tin., 1872, p. 261.—WALSH, Proc. Ent. Soc. Phila., VI, 1866, p. 273.—PACKARD, Guide, 1870, p. 350.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, pp. 122, 143.—RILEY, Smith's List Lep. Bor. Am., No. 5367, 1891.
- ?*Gelechia salicifungiella* CLEMENS, Proc. Ent. Soc. Phila., III, 1864, p. 508; Stainton, Ed. N. Am. Tin., 1872, p. 262.—WALSH, Proc. Ent. Soc. Phila., VI, 1866, p. 273.—PACKARD, Guide, 1870, p. 350.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, pp. 122, 147.—RILEY, Smith's List Lep. Bor. Am., No. 5475, 1891.
- Aristotelia fungivorella* BUSCK, Dyar's List Amer. Lep., No. 5579, 1903.

Clemens' types in the Philadelphia Academy of Natural Sciences are lost. In the U. S. National Museum is a specimen labeled *fungivorella* by Riley and another, identical, named by Lord Walsingham.

From the mounting, the pin and the label of the Riley specimen I have a strong suspicion that it is really one of Clemens' type specimens, or at least one of the specimens originally bred by Walsh. They agree well with description. I have accidentally bred a series of what I believe is this species from willow, presumably from unnoticed cecidomid galls on the leaves in my cage. I have also beaten this same species from willow repeatedly in the vicinity of Washington.

It seems likely that *salicifungiella* bred at the same time also from willow galls, and which, according to Clemens, has the same character of markings, is only a variety of *fungivorella*, as Clemens himself suggested.

Careful and extensive breeding will here again enable definite conclusions to be drawn.

Habitat.—Illinois (Walsh); District of Columbia (Busck).

ARISTOTELIA IVÆ Busck.

Aristotelia ivæ Busck, Proc. U. S. Nat. Mus., XXII, 1900, p. 225, pl. 1, fig. 1.—
DYAR, Proc. Ent. Soc. Wash., p. 470, 1901.—Busck, Dyar's List Amer. Lep.,
No. 5580, 1903.

This species is very near to what I take to be *fungivorella* Clemens, but the knowledge of the larva and its life mode at once show the distinctiveness of the species.

Habitat.—Palm Beach, Florida (Dyar).

Food plant.—*Iva frutescens*.

Type.—No. 4932. U.S.N.M.

ARISTOTELIA BIFASCIELLA, new species.

Aristotelia bifasciella Busck, Dyar's List Amer. Lep., No. 5581, 1903.

Antennæ dark fuscous, with narrow silvery annulations. Labial palpi whitish; second joint mottled with dark brown; terminal joint with two dark brown annulations. Face, head, and thorax light ochreous. Forewings dirty yellowish white, with two conspicuous dark brown fasciæ: the first oblique from basal third of costa to middle of dorsal edge; the other is broader and nearly perpendicular on costal edge at apical third; both are shaded with lighter yellowish brown toward the dorsal edge. Just before apex is a dark brown costal spot, continued in a very light yellowish area across the wing. Extreme base of costa blackish brown. Hindwings light fuscous, cilia yellowish. Abdomen ochreous; legs whitish, with dark brown shadings on the outside; tarsi blackish brown, with tip of each joint white.

Alar expanse.—14 to 16 mm.

Habitat.—Argus Mountains, Arizona.

Type.—No. 6349, U.S.N.M.

A large easily recognized species, unlike any described American *Aristotelia*, but reminding one somewhat in size and coloration of *Epitheetis bicostomaculella* Chambers.

ARISTOTELIA ELEGANTELLA Chambers.

Gelechia elegantella CHAMBERS, Can. Ent., III, 1872, p. 239; IX, 1877, p. 23; Bull. U. S. Geol. Surv., IV, 1878, p. 143.—RILEY, Smith's List Lep. Bor. Am., No. 5358, 1891.

Gelechia superbella CHAMBERS, Can. Ent., VII, 1875, p. 32.

Aristotelia elegantella Busck, Dyar's List Amer. Lep., No. 5582, 1903.

I have examined the types of this charming species in Cambridge; it was described from Texas, and later recorded from Missouri by Chambers. In the U. S. National Museum are specimens from Arizona and New Mexico, the latter collected by Mr. T. D. A. Cockerell. One specimen is labeled *Pa.*, but probably by mistake, as it is likely confined to southern localities. I have never seen it in the vicinity of Washington.

ARISTOTELIA ARGENTIFERA, new species.

Aristotelia argentifera Busck, Dyar's List Amer. Lep., No. 5583, 1903.

Antennae slightly serrate toward the tip, black, with silvery-white annulations. Labial palpi, second joint light brown, with two incomplete white annulations; terminal joint blackish brown, with extreme tip and three narrow annulations white. Face whitish, tinged with brown; head and thorax light brown, intermixed with slate-colored scales. Forewings clear, deep brown, overlaid on costal half with dark, blackish brown. From near base of costa is an outwardly directed oblique white fascia, reaching nearly to dorsal margin, and edged and continued by strongly metallic silvery and bluish iridescent scales. At middle of wing is a costal white dash, continued downward and slightly inward nearly to the dorsal edge by a fascia of metallic scales. At beginning of costal cilia is a similar larger white dash, continued obliquely inward and downward by a line of metallic scales. Between the first and the second fascia is an additional smaller white costal spot, edged by metallic scales, and at the extreme apex is an ill-defined small group of white scales. From the very base of the wing outward and downward is a thin line of iridescent and silvery white scales, and single iridescent scales are found irregularly and sparsely in the other part of the wing. Cilia whitish, mixed with brown. Hindwings light silvery fuscous; cilia, with a golden-brown tint.

Abdomen brown with each joint tipped with silvery white. Legs blackish brown with silvery white bars and annulations; spurs silvery white.

Alar expanse.—10.5 to 11.5 mm.

Habitat.—San Francisco County, California.

Type.—No. 6350, U.S.N.M.

Described from 10 well-preserved specimens collected in October, probably by Mr. Koebele, judging from the elegant mounting.

I found a single specimen of this species in the Museum of Comparative Zoology in Cambridge, labeled by Lord Walsingham "*Gelechia argentifera*," which appropriate name I am pleased to adopt.

ARISTOTELIA COCKERELLA, new species.

Aristotelia cockerella Busck, Dyars List Amer. Lep., No. 5584, 1903.

Antennae dark brown with yellow annulations. Labial palpi yellow, second joint sparsely sprinkled with black. Face, head, and thorax light greenish yellow. Basal two-thirds of forewings light yellow, concolorous with thorax; apical third dark purplish brown with a slight touch of yellow on costal edge before apex. The limit between these two colors is oblique and sharply drawn, forming a straight line from the beginning of costal cilia obliquely inward to apical two-fifths

of dorsal edge, the yellow reaching farther outward at costa and the brown reaching farther inward at dorsal edge.

On the dividing line between the two colors is an oblique row of three circular metallic golden spots edged with deep black. Cilia dark brown. Hindwings shining bluish black; cilia brown.

Abdomen deep brown above; on the underside is each joint edged by a silvery white transverse line; anal tuft yellow. Legs greenish yellow; tarsi black with white annulations.

Alar expanse.—11.5 to 12.5 mm.

Habitat.—Mesilla Park, New Mexico. (Cockerell.)

Type.—No. 6351, U.S.N.M.

Named in honor of the collector, who has sent me this exquisite species among several other *Tineina*. It is somewhat on the order of *Aristotelia elegantella* Chambers and fully as handsome.

ARISTOTELIA ABSCONDITELLA Walker.

Gelechia absconditella WALKER, Cat. Lep. Het. Br. Mus., XXIX, 1864, p. 595.—

RILEY, Smith's List Lep. Bor. Am., No. 5298, 1891.

Gelechia [*Anacampsis*] *absconditella* WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 181.

Anacampsis absconditella DIETZ, Smith's List Ins. N. Jersey, 1900, p. 475.

Gelechia palpianulella CHAMBERS, Can. Ent., IV, 1872, p. 68; Bull. U. S. Geol. Surv., IV, 1878, p. 145.

Aristotelia absconditella BUSCK, Dyar's List Amer. Lep., No. 5585, 1903.

Chambers's types of this species in Cambridge are identical with a large bred series in U. S. National Museum, determined by Lord Walsingham. The larvæ live in the stems of *Polygonum acre*, causing a slight swelling at the joints, and are found very commonly in the vicinity of Washington. Frequently every joint of a plant contains a larva. The species overwinters in the stems as larvæ, and the moths issue during May and June. It is of interest to note that the peculiar shining color of this species is identical with that of another *Polygonum* feeding *Tineid*, *Gelechia discooceliella* Chambers.

The superficial resemblance to the *tensionella* group of Europe has induced Lord Walsingham, and subsequently Dr. Dietz, to place this species in *Approxema* Durrant (*Anacampsis* auct.), but the venation shows that it belongs to the present genus.

This species has been bred in the insectary of U. S. Department of Agriculture under the number 3373.

Under No. 4575 has been reared another large series of *Aristotelia* from the roots of *Ampelopsis quinquefolia*, received from Mr. G. Barlow, Cadet, Missouri, and issued in March and April, 1890.

These moths average a trifle larger than those bred from *Polygonum*, but I can not otherwise distinguish them, and am forced, at present at least, to place them under this species in spite of the improbability that one species should have both food plants. Possibly some mistake

may have taken place in the record. Even the minute characteristics of the antennae and palpi, pointed out by Lord Walsingham in *absconditella*, are found identically in the specimens bred from *Ampelopsis*.

I have seen specimens of this species from New Jersey, Pennsylvania, Maryland, District of Columbia, Virginia, West Virginia, and Missouri.

ARISTOTELIA MINIMELLA Chambers.

Gelechia minimella CHAMBERS, Can. Ent., VI, 1874, p. 243; Bull. U. S. Geol. Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5411, 1891.
Aristotelia minimella BUSCK, Dyar's List Amer. Lep., No. 5586, 1903.

Type no. 455 in the U. S. National Museum, labeled by Chambers and received from him as type of *Gelechia minimella*, is, together with two similar types in Cambridge, the only authentic material left by Chambers of this species.

All three are in bad condition, but I have saved for posterity the loose wings of one side of the type in the National Museum on a slide, which, under the microscope, shows that the specimen is a true *Aristotelia*.

I believe that the Cambridge specimens are identical, but their condition does not permit certainty. However, under the circumstances I feel justified to hold the National Museum specimen as the type, thus enabling us to put down the species as a known quantity instead of as an uncertain, name belonging to a valueless description.

I have received specimens of this *Aristotelia* reared from oak by Miss Mary Murtfeldt at Kirkwood, Missouri.

The types are from Texas. In the National Museum are specimens from New Jersey (Kearfott) and District of Columbia (Busck).

ARISTOTELIA PHYSALIELLA Chambers.

Gelechia physaliella CHAMBERS, Can. Ent., IV, 1872, p. 173; Cinn. Quart. Jour. Sc., II, 1875, p. 238; Bull. U. S. Geol. Surv., III, 1877, p. 128; IV, 1878, pp. 117, 145.—RILEY, Smith's List Lep. Bor. Am., No. 5446, 1891.
Aristotelia physaliella BUSCK, Dyar's List Amer. Lep., No. 5587, 1903.

Type No. 457 in the U. S. National Museum, received from Chambers and labeled in his handwriting, undoubtedly represent this species. I have met with no other specimens in other collections.

Habitat.—Kentucky, Arizona. (Chambers.)

Food plant.—*Physalis viscosa*. (Chambers.)

ARISTOTELIA DISCONOTELLA Chambers.

Gelechia disconotella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, pp. 86, 143.—RILEY, Smith's List Lep. Bor. Am., No. 5354, 1891.
Aristotelia disconotella BUSCK, Dyar's List Amer. Lep., No. 5588, 1903.

The type of this species with Chambers' handwriting on the label

is in the Museum of Comparative Zoology. It is in fairly good condition and agrees well with his description.

In the National Museum is a perfect specimen, bred by Mr. F. C. Pratt from stem of raspberry, June 2, 1898.

Habitat.—Kentucky (Chambers). District of Columbia (Pratt).

ARISTOTELIA GILVOLINIELLA Clemens.

Gelechia gilvoliniella CLEMENS, Proc. Ent. Soc. Phila., II, 1863, p. 119; Stainton Ed. N. Am. Tin., 1872, pp. 223, 224.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 143.—RILEY, Smith's Hist. Lep. Bor. Am., No. 5380, 1891.

Aristotelia gilvoliniella BUSCK, Dyar's List Amer. Lep., No. 5589, 1903.

The type of this species is lost, but from Dr. William Dietz I have received a specimen, which he has determined as *gilvoliniella*, and which I have no doubt really represents this species. It agrees well with description and is a typical *Aristotelia*.

The specimen in National Museum, as well as others in Dr. Dietz's collection, were collected in Pennsylvania, where presumably Clemens also found his type.

ARISTOTELIA KEARFOTTELLA, new species.

Aristotelia kearfottella BUSCK, Dyar's List Amer. Lep., No. 5590, 1903.

Antennæ fuscous, silvery white at base. Labial palpi silvery white; second joint with a black bar on the outside; terminal joint longer than second joint, with tip black. Face, head, and thorax silvery white. Forewings at base silvery white, gradually becoming overlaid with fuscous outward; outer half of wing dark fuscous with a silvery yellowish luster. At the end of the cell is a small round black dot. At beginning of costal cilia is a short oblique triangular light yellow spot. At base of cilia, round the entire apical edge, is a heavy deep black line, interrupted by four costal and three dorsal short indistinct yellowish-white dashes, which are faintly continued out in the dark fuscous cilia. Dorsal edge opposite the costal triangular spot yellowish. The underside of the forewings is uniformly dark, shining fuscous, with the costal spot and the apical streaks of yellow faintly indicated.

Hindwings dark fuscous, nearly black, with silvery reflexions; cilia dark steel-gray; abdomen dark gray; legs silvery white; tuft on hind tibiae yellowish; tarsi shaded with fuscous.

Alar expanse.—12 mm.

Habitat.—Pennsylvania, New Jersey.

Type.—No. 6352, U.S.N.M.

Cotypes are in the collection of Mr. William D. Kearfott, in honor of whom I name this species and from whom the National Museum has obtained its specimens.

ARISTOTELIA QUINQUEPUNCTELLA, new species.

Aristotelia quinquepunctella BUSCK, Dyar's List Amer. Lep., No. 5591, 1903.

Antennæ light yellowish brown, annulated with white. Labial palpi, second joint fuscous with white apex; terminal joint yellow with fuscous shading toward the tip. Face yellowish white. Head and thorax yellow. Forewings pale whitish yellow, sparsely sprinkled with fuscous on disk, more strongly overlaid with fuscous along the edges and gradually more so toward the tip, which is quite dark. On the disk are four nearly equidistant black prominent dots forming a rhomb; one within the costal edge at basal third, one opposite a little farther outward, within dorsal margin on the fold, a third also on the fold near base, and the fourth on the middle of the wing. A fifth similar black spot is found just outside the end of the cell at the same distance from point four as that between the other dots. Cilia yellow with an indistinct dark line at base parallel with the edge of the wing. Hindwings light silvery fuscous. Cilia dark yellowish fuscous. Abdomen dark fuscous. Legs yellowish, shaded with fuscous; anterior coxæ in front dark fuscous.

Alar expanse.—11.5 mm.

Habitat.—Pennsylvania (June).

Type.—No. 6353. U.S.N.M.

The moth has a certain general resemblance with *Trichotaphe trimaculella* Chambers. I have tried to reconcile this species with the description of the unrecognized *Gelechia punctiferella* Clemens, which seems to be a similar species, but without success.

HELICE Chambers.

Plate XXIX, fig. 12.

Helice CHAMBERS, Can. Ent., V, 1873, p. 187.

Labial palpi very long, smooth, curved; second joint somewhat thickened toward apex with appressed scales; terminal joint longer than second, slender, pointed.

Forewings narrow, elongate ovate, pointed; 11 veins, 5 absent, 7 and 8 out of 6, 3 and 4 stalked. Hindwings narrower than forewings, apex produced pointed, termen emarginate, anal angle rounded; 6 veins, 5 and 6 absent, 3 and 4 stalked, transverse vein obsolete. Forewing with tufts of raised scales.

Only the one species is known.

HELICE PALLIDOCHELLEA Chambers.

Helice pallidochrella CHAMBERS, Can. Ent., V, 1873, pp. 188, 230; VII, 1875, p. 105; IX, 1877, p. 231; Bull. U. S. Geol. Surv., IV, 1878, p. 150.—BUSCK, Journ. N. Y. Ent. Soc., X, 1902, p. 89; Dyar's List Amer. Lep., No. 5592, 1903.

Helice palidochrella CHAMBERS, Can. Ent., IX, 1877, p. 15.

Helice gleditschiella CHAMBERS, Can. Ent., IX, 1877, p. 232.

Gelechia gleditschiella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., 1891, p. 113.

Not *Helice pallidochrella* WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 188.—MURTFELDT, Can. Ent., XV, 1883, p. 95.

I have given a full review of this species, types of which are in the Museum of Comparative Zoology and in U. S. National Museum.

Habitat.—Kentucky.

EVIPPE Chambers.

(Plate XXIX, fig. 13.)

Evippe CHAMBERS, Can. Ent., V, 1873, p. 185.

Phaetusa CHAMBERS, Can. Ent., VII, 1875, p. 106.

Labial palpi long recurved, nearly smooth, second joint somewhat thickened beneath, terminal joint slender, pointed, nearly as long as second joint. Forewings elongate ovate, pointed, 12 veins, 7 and 8 out of 6, 4 and 5 connate, or short stalked, rest separate.

Hindwings nearly as broad as forewings, trapezoidal, apex produced, pointed, termen sinuate; 7 veins, 6 absent, 7 to costa just before apex, 3 and 4 connate, 5 approximate to 4, 2 distant. Cell not closed between 5 and 7.

Chambers's types of the types of both genera are in the U. S. National Museum and prove that they are congeneric. Chambers compared generically and specifically his *Phaetusa plutella* with *Evippe prunifoliella* saying:

The only reason for separation is found in the neurulation. The other characters are those of *Evippe*, and it (*plutella*) is very near to *prunifoliella* in ornamentation.¹

But he contradicts himself in trying to show the supposed differences in venation by writing that

The last branch of median vein in forewing of *Evippe* is simple, while in the original description of that genus he says:

Median becomes furcate behind the cell.

And this he repeats while describing his genus *Eidothoa*.²

The latter statement is correct, and thus it is also in *Phaetusa*, as stated by Chambers.

The only other differences in venation pointed out by Chambers are in the hindwings, where he thought that vein 6 and discal nervure is present in *Phaetusa* while absent in *Evippe*. It is easy to see, with a perfect side of the wing before one, how the fold has misled Chambers to see a vein 6, which really is not present, and a similar mistake

¹ Can. Ent., VII, p. 106.

² Idem., V, p. 187.

about the discal vein is quite natural, considering how rather crude his way of denuding such very small and delicate wings was.¹

Thus the name *Phatusa*, which was preoccupied anyway, must be dropped as synonymous with *Evippe*.

Lord Walsingham suggested² that the two species even were identical, but Chambers³ wrote that he could not agree to that view, and the two types in U. S. National Museum, as well as his types in Cambridge, support Chambers. They surely represent two good species, which may be separated thus:

With white costal spot..... *prunifoliella*
Without white costal spot..... *leuconota*

EVIPPE PRUNIFOLIELLA Chambers.

Evippe prunifoliella CHAMBERS, Can. Ent., V, 1873, p. 186; VII, 1875, p. 105; IX, 1877, p. 23; Bull. U. S. Geol. Surv., IV, 1878, pp. 112, 141.—BUSCK, Dyar's List Amer. Lep., No. 5593, 1903.

Gelechia prunifoliella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 146.—WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 177.—MURTFELDT (Chambers quoted), Can. Ent., XV, 1883, p. 94.—RILEY, Smith's List Lep. Bor. Am., No. 5452, 1891.

An authentic specimen received from Chambers and with his label on the pin is in U. S. National Museum. Also several other specimens, bred from *Prunus* by Miss Murtfeldt, from peach by Mr. Chambliss and from both by the writer.

Habitat.—Kentucky (Chambers), Missouri (Murtfeldt), Tennessee (Chambliss), District of Columbia (Busek).

EVIPPE LEUCONOTA Zeller.

Gelechia [Teleia] leuconota ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 268, pl. III, fig. 21.

Gelechia leuconota CHAMBERS, Bull. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5401, 1891.

Phatusa plutella CHAMBERS, Can. Ent., VII, 1875, p. 106; Bull. U. S. Geol. Surv., IV, 1878, p. 160.—WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 177.—MURTFELDT, Can. Ent., XV, 1883, p. 94.—RILEY, Smith's List Lep. Bor. Am., No. 1512, 1891.

Evippe leuconota BUSCK, Dyar's List Amer. Lep., No. 5594, 1903.

Chambers himself suggested the above synonymy, and his type of *Phatusa plutella* in the U. S. National Museum (No. 466) proved on comparison with Zeller's type of *Gelechia leuconota* in the Museum of Comparative Zoology to be identical.

Habitat.—Texas.

¹Can. Ent., IV, p. 41.

²Trans. Am. Ent. Soc. Phila., X, 1882, p. 177.

³Through Miss Murtfeldt, Can. Ent., XV, p. 94-95.

EUCORDYLEA Dietz.

Plate XXIX, fig. 14.

Eucordylea DIETZ, Ent. News, XI, 1900, p. 349.

Labial palpi large, robust, second joint with dense expansible tuft of long hairs on the upper side, terminal joint shorter than second, smooth, pointed.

Forewings elongate, narrow, dorsal edge slightly sinuate at vein 2, apex obtusely pointed; 12 veins, 7 and 8 out of 6; 3, 4, and 5 long, approximate from lower corner of cell; 2 distant, short. Hindwings trapezoidal, apex blunt, termen slightly bisinuate; 8 veins, 3 and 4 nearly connate, 5 approximate to 4, 6 and 7 connate.

This genus is a specialized development from *Recurvaria* Haworth, easily recognized by the peculiar palpi.

Only the one species is described; in Dr. Dietz's collection is another, smaller, mottled-gray species, which he kindly offered the writer for description, but it is not, in my judgment, in sufficiently good condition to describe.

I am under obligation to Dr. Dietz for his liberal permission to make a slide of his unique type specimen in order to determine the venation with certainty. The figure is made from this type slide.

EUCORDYLEA ATRUPICTELLA Dietz.

Eucordylea atrupictella DIETZ, Ent. News, XI, 1900, p. 350, pl. 1, figs. 1 and 1a.—
BUSCK, Dyar's List Amer. Lep., No. 5595, 1903.

I have had opportunity to study carefully the type of this species in Dr. Dietz's collection; it is a male. In the U. S. National Museum is another perfect male specimen, received from A. W. Hanham, collected in Ontario, Canada; the type is from Pennsylvania.

RECURVARIA Haworth.

Plate XXIX, fig. 15.

Recurvaria HAWORTH, Lep. Brit. Lond., 1829, p. 547.

Eragora CLEMENS, Proc. Acad. Nat. Sc. Phila., 1860, p. 165.

Elidethoa CHAMBERS, Can. Ent., V, 1873, p. 186.

Sinoë CHAMBERS, Can. Ent., V, 1873, p. 231.

Aphananta MEYRICK, Handbook Br. Lep., 1895, p. 579.

Not *Recurvaria* (Haworth) MEYRICK, Handbook Br. Lep., 1895, p. 606.

Labial palpi slightly thickened, with rough scales beneath; terminal joint pointed, shorter than second joint. Forewings elongate, narrow, pointed, dorsal edge slightly sinuate at vein 2; 12 veins, 7 and 8 out of 6; 3, 4, 5 long, approximate from end of cell, 2 short, separate. Hindwings narrower than forewings, trapezoidal, apex produced, pointed, termen sinuate; 8 veins, 3 and 4 connate, 5 approximate to 4, 6 and 7 approximate. Forewings often with raised scales. The males of several of the American species have the costal hair pencil at base of

hindwing, which Zeller mentions in his species, belonging to this genus and which Lord Walsingham regarded as of generic value.¹

I have before (p. 771) given the reasons why I can not agree with him in this.

Clemens's careful definition of *Eragora apicitripunctella* does not leave any doubt about the generic characters of that species, even if there may be some differences of opinion about the identification of the species (p. 809).

The type of Chambers's genus *Sinoë* is *fuscopallidella*, of which the unique type is in the Museum of Comparative Zoology. This is in very poor condition, but shows positively that its generic characters are the same as those of *Eragora* and of the two European species, *nanella* Hübner and *leucatella* Linnaeus, at present included by Staudinger and Rebel in *Recurvaria* as now restricted (*Aphanaula* Meyrick).

The type of Chambers's genus *Eidothoa*, *vagationella*, I regard as synonymous with Zeller's *Gelechia dorsivittella*, which also belongs to the present genus.

The recognized species of *Recurvaria* in America may be separated by the following table:

Forewings more or less ochreous	1
Forewings not ochreous	4
1. Labial palpi pure white	<i>variella</i> , p. 809
Labial palpi with dark markings	2
2. Forewings with distinct row of black dots on costal apical edge	3
Forewings without such distinct dots	<i>obliquestrigella</i> , p. 811
3. Forewings with indistinct angulated whitish fascia	<i>apicitripunctella</i> , p. 808
Forewings without such fascia	<i>colobrinæ</i> , p. 810
4. Forewings very dark, nearly unicolorous	<i>nigra</i> , p. 814
Forewings lighter, not unicolorous	5
5. Forewings with oblique pronounced costal white streak at basal third	<i>crystalis</i> , p. 814
Forewings without such pronounced streak	6
6. Forewings with black dorsal patch near base	<i>robinella</i> , p. 812
Forewings without such patch	7
7. Dorsal edge of wings pure white	<i>dorsivittella</i> , p. 813
Dorsal edge not white	8
8. Males with costal hair pencil at base of hindwing	<i>quercivorella</i> , p. 813
Males without such hair pencil	<i>cratagella</i> , p. 811

RECURVARIA APICITRIPUNCTELLA Clemens.

Eragora apicitripunctella CLEMENS, Proc. Acad. Nat. Hist. Phila., 1860, p. 165; Stainton Ed. No. Am. Tin., 1872, p. 120.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5297, 1891.

Gelechia (Eragora) apicitripunctella WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 182.

Gelechia abietisella PACKARD, U. S. Dept. Agr. Rep., 1883, p. 150, pl. III, fig. 2; pl. XIII, fig. 7; Rep. U. S. Ent. Comm., 1890, p. 876, pl. IX, fig. 2; pl. XXVI, fig. 7.

Recurvaria apicitripunctella BUSCK, Dyar's List Amer. Lep., No. 5596, 1903.

¹Proc. Zool. Soc. Lond., 1897, p. 64.

While there is no difficulty about the identity of Clemens's genus, it is not quite so satisfactory with the specific identity of his type of the genus.

Lord Walsingham placed it as synonymous with Zeller's *gilvoscopella*, and as Clemens' type is not in existence it is difficult to prove or disprove the identity absolutely, and I should have left it on Walsingham's authority, even though the synonymy seemed very strange from the quite different descriptions of the two species, if I had not been able to examine the evidence on which Lord Walsingham based his opinion in 1882.

These specimens (labeled with Lord Walsingham's blue labels, nos. 148, 149, and 150, corresponding to his identification in his notebook¹), are in Professor Fernald's collection, and they surely are not the same as the type of Zeller's *gilvoscopella*, preserved in excellent condition in the Museum of Comparative Zoology.

They are in rather poor condition, but agree as far as can be made out with undoubted specimen of *abietisella* Packard, a large, bred series of which is in the U. S. National Museum.

Here also are to be found two specimens labeled in Lord Walsingham's handwriting *apicitripunctella*, one determined in 1887 and one in 1891. The first is bred from locust and is *robinella* Fitch (p. 812), and the other is the same as the specimens in Professor Fernald's collection and is *abietisella* Packard.

That Lord Walsingham at that time, with the limited material at his command, was not very certain about these nearly related, similar species is shown by his suggestion² that *dorsivittella* Zeller and *cristatella* Chambers might also be mere varieties of *apicitripunctella*.

Clemens's description agrees well with *abietisella*, but can not be reconciled with Zeller's description of *gilvoscopella*, the one belonging to the ochreous group, the other to the fuscous.

While, then, absolute proof about this species can not be obtained because the type is lost, it seems evident to me, after careful analysis of the different descriptions and with large series of mostly bred specimens of all these allied species before me, that *apicitripunctella* (1) can not be Zeller's *gilvoscopella*, and (2) can not be any other species than Packard's *abietisella*.

Food plant.—*Abies canadensis*.

The males have the hair pencil at base of the hindwings.

RECURVARIA VARIELLA Chambers.

Gelechia variella CHAMBERS, Can. Ent., IV, 1872, p. 174; VI, 1874, p. 241; Bull. U. S. Geol. Surv., IV, 1878, p. 148.—RILEY, Smith's List Lep. Bor. Am., No. 5507, 1891.

Recurvaria variella BUSCK, Dyar's List Amer. Lep., No. 5597, 1902.

¹See preface, p. 768.

²Trans. Am. Ent. Soc. Phila., X, p. 182.

Type No. 465 in the U. S. National Museum of this species, received from Chambers with his handwriting on the label, is identical with types in the Museum of Comparative Zoology in Cambridge.

They are in very poor condition, but agree well with description, and unquestionably represent this species. A slide of the wings made from the one side of the National Museum type, for the double purpose of preserving and studying the species, shows that it belongs in the present genus.

I have bred a large series of these moth from bald cypress (*Taxodium distinctum*) on grounds of the U. S. Department of Agriculture, Washington, District of Columbia. The larvæ work in the same way as *apictripunctella* on hemlock, uniting a few needles and feeding between them. The pupa is also found in silk lined tubes formed of a few needles. Several generations occur during the summer, the imagoes of one of which are very abundant in early July.

RECURVARIA COLUBRINÆ, new species.

Recurvaria colubrinæ BUSCK, Dyar's List Amer. Lep., No. 5598, 1902.

Antennæ light brown with white annulations. Labial palpi with second joint light brown, white at apex; terminal joint white with a broad brown annulation round middle and a narrow one just before the tip.

Face, head, and thorax reddish white with scattered light-brown scales. Forewings dirty ochreous white, outer half suffused with light fuscous. On costa are three equidistant brown spots, one near base, one at middle, and one at the beginning of costal cilia. In the middle of the wing are three small brown spots in a straight longitudinal line, one at basal third, one at middle of wing, and one at the end of the cell. Just within the dorsal cilia are two large ill-defined longitudinal brown spots, and at apical edge is a row of dark dots.

Cilia whitish, mixed toward apex with fuscous. Hindwing silvery fuscous, cilia yellowish. Legs dark brown with white annulations; posterior tibial above yellowish white.

Alar expanse.—10 mm.

Type.—No. 6354, U.S.N.M.

This moth was bred in the insectary of U. S. Department of Agriculture by Mr. Th. Pergande, from *Psylla* galls on *Colubrina texensis* received from Mr. E. A. Schwarz, from Rockport, Texas, August, 1894.

Mr. Pergande writes in the notebook on this species under no. 6336:

Found in *Psylla* galls on *Colubrina texana*, a small Tineid larva of a yellowish white color with the incisions between the segments pinkish and the head and cervical shield yellow. This larva feeds upon the *Psyllids*; there were also found within the galls a few pupæ belonging to this larva.

Although unwilling to doubt so careful and trained an observer as Mr. Pergande, I would say that the generic relations of the species

indicate that the Psyllid-galls were merely used as an accidental convenient retreat for pupation and that the species probably is a vegetable feeder as the other species of the genus, whose life histories are known.

RECURVARIA OBLIQUISTRIGELLA Chambers.

Anarsia obliquistrigella CHAMBERS, Can. Ent., IV, 1872, p. 65.

Gelechia obliquistrigella CHAMBERS, Can. Ent., IV, 1872, p. 175; VII, 1875, p. 106; IX, 1877, p. 24; X, 1878, p. 50; Bull. U. S. Geol. Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5422, 1891.

Recurvaria obliquistrigella BUSCK, Dyar's List Amer. Lep., No. 5599, 1902.

Not *Gelechia obliquistrigella* PACKARD, U. S. Ent. Comm. Rep., V, 1890, p. 850, fig. 284.

In Professor Fernald's collection I have examined several specimens received from Chambers as this species and identified by Lord Walsingham in 1882 as *obliquistrigella*. One of these I obtained through the kindness of Professor Fernald for the U. S. National Museum. They are identical with the type in the Museum of Comparative Zoology, as far as the miserable condition of this latter permits identification. At least they agree generically and belong to the present genus. These specimens agree tolerably well with Chambers's description.

Packard¹ figures a *Gelechia*, bred from spruce and which had been determined by Professor Fernald as *Gelechia obliquistrigella*.

But the species figured is surely not the present species, agreeing neither with the types nor with the description of *obliquistrigella*, the food plant of which must for the present stand unknown.

This species has not the hair pencil at base of hindwing in the males.

RECURVARIA CRATAEGELLA, new species.

Recurvaria crataegella BUSCK, Dyar's List Amer. Lep., No. 5600, 1902.

? *Recurvaria nanella* HÜBNER, Standinger and Rebel Cat. Eur. Lep., II, No. 2874, 1901.

Antennæ whitish with indistinct narrow dark-brown annulations. Labial palpi whitish with two black annulations on each joint, tip white. Face, head, and thorax white suffused with fuscous.

Forewings white thickly sprinkled with fuscous. From near the base of costa is an outwardly directed oblique ill-defined black streak, not reaching to the dorsal edge, more or less interrupted at the fold and bordered on the outside with white scales. From middle of costa is a similar, parallel, interrupted dark streak still less clearly defined. At the end of the cell in middle of wing is a short black longitudinal streak; below this on dorsal edge is a small black spot and on costal edge is two similar black spots, one at apical third, the other just

¹U. S. Ent. Comm. Report, V, p. 850, fig. 284.

before apex. Cilia white, speckled black, and fuscous. Hindwings light silvery fuscous, cilia a shade lighter than wing; male without costal hairpencil.

Abdomen dark fuscous, anal tuft silvery gray; legs white with black annulations; hairs on posterior tibia silvery white. Alar expanse, 12 mm.

Type.—No. 6355, U.S.N.M.

Bred by Dr. William Dietz in Hazleton, Pennsylvania, from *Cratægus tomentosus* in June, but without any notes on the larva or its habit.

The species is very near the other fuscous species of the genus and easily mixed with *cristatella* Chambers, but besides minor colorational differences, it differs in the lack of hairpencil at base of hindwings in the male.

I am, at present, unable to separate this species from a series of authentic European specimens of *Recurvaria nanella* Hübner, and I am conscious of the probability of my making a synonym of this species, the life history of which, according to Meyrick's Handbook of British Lepidoptera, is not definitely known, but which is variously said to feed in flowers or in shoots of pear or on lichens growing on the trunk.

As long as definite knowledge of the larva of both species is lacking, I regard it a much better policy to treat the American form as a distinct species, instead of running the risk of wrongly recording European species in America, which has already been done, too hastily in my opinion, in other groups of *Tineinæ*. Such records are very difficult to disprove, and, if wrong, not only encumber our lists and tables, but give false ideas of geographical distribution.

RECURVARIA ROBINIELLA Fitch.

Anacampsis robiniella FITCH, Rep. Nox. Benef. Insects N. York, V, 1859, p. 835.—CHAMBERS, Can. Ent., III, 1871, pp. 163, 183.

Gelechia robiniella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 146.—RILEY, Smith's List Lep. Bor. Am., No. 5469, 1891.

Sinoë fuscopallidella CHAMBERS, Can. Ent., V, 1873, p. 231; VII, 1875, pp. 105, 106.

Gelechia (Sinoë) fuscopallidella CHAMBERS, Can. Ent., IX, 1877, p. 24; Rep. U. S. Dept. Agr., 1879, p. 225.

Gelechia fuscopallidella CHAMBERS, Bull. U. S. Geol. Surv., 1878, IV, p. 143.—RILEY, Smith's List Lep. Bor. Am., No. 5371, 1891.

Gelechia robiniaefoliella CHAMBERS, Rep. U. S. Dept. Agr., p. 224, 1879.

Recurvaria robiniella BUSCK, Dyar's List Am. Lep., No. 5601, 1902.

As already realized by Chambers, Fitch evidently made a mistake in associating his moth described as *Anacampsis robiniella* with the larva and mine described under that name. This is clear, as he could not breed a moth with alar expanse 0.45 inch from a full-grown larva only 0.18 inch long.

Fitch collected his *Robinia* leaves in the autumn and in the spring his moth appeared, so it seems reasonable that some other larger larva

have been present, unnoticed by Fitch, from which the moth came, which he associated with the larva and mine, he had taken notes on the previous fall. His description of the moth is not very satisfactory, but there is no other species feeding on Robinia but the present of about the size he gives, and it is reasonably certain that this is the species he had under consideration.

Chambers's type of *Sina fuscopallidella* I have examined in the Museum of Comparative Zoology. It is in very poor condition, but agrees well with the description as far as could be made out, and shows positively that its generic characters are identical with those of *Eragora* Clemens, and also that it is specifically identical with the common Robinia-feeding species, which Chambers later described as *Gelechia robiniaefoliella*, he himself suggesting that it was the same species as previously described by him as *fuscopallidella*.

A large bred series is in U. S. National Museum.

The males have no hairpencil at base of hindwing.

Habitat.—Texas, Kentucky, eastern United States.

RECURVARIA QUERCIVORELLA Chambers.

Gelechia quercivorella CHAMBERS, Can. Ent., IV, 1872, p. 173; Bull. U. S. Geol. Surv., IV, 1878, p. 146.—RILEY, Smith's List Lep. Bor. Am., No. 5462, 1891.

Gelechia (Teleia) gilviscopella ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 266.

Gelechia gilviscopella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5297 (part) 1891.

Recurvaria quercivorella BUSCK, Dyar's List Amer. Lep., No. 5602, 1903.

Zeller's two types (males) of *gilviscopella* in the museum in Cambridge are in perfect condition and show this species to be a much larger and darker species than Clemens' *apictripunctella*. Identical specimens in large series are in U. S. National Museum. The type in Cambridge of Chambers' *quercivorella* is in miserable condition, consisting only of head with palpi, thorax, and one forewing. It is, however, undoubtedly a *Recurvaria*, and I have no hesitancy, after careful comparison with Zeller's types of *gilviscopella*, to determine it as the same as this species, which is also an Oak-feeder.

Chambers' name must take precedence.

Habitat.—Kentucky, Texas, eastern United States.

RECURVARIA DORSIVITTELLA Zeller.

Gelechia (Tellia?) dorsivittella ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 267, pl. III, fig. 20.

Gelechia dorsivittella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 143.—RILEY, Smith's List Lep. Bor. Am., No. 5357, 1891.

Aristotelia dorsivittella WALSINGHAM, Proc. Zool. Soc. Lond., 1897, p. 66.

Aristotelia dorsivittella DIETZ, Smith's List Ins. N. Jersey, 1900, p. 475.

Eidothoa vagatiolla CHAMBERS, Can. Ent., V, 1873, p. 187; VII, 1875, p. 105.

Gelechia vagatiolla CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 147.—RILEY, Smith's List Lep. Bor. Am., No. 5505, 1891.

Recurvaria dorsivittella BUSCK, Dyar's List Amer. Lep., No. 5603, 1903.

Type of *dorsivittella* was found in the museum in Cambridge in good condition in May, 1900, and agrees with a specimen determined by Lord Walsingham in the U. S. National Museum.

I assume the synonymy of Chambers' *vagatiolla*, which seems reasonably certain from the generic and specific descriptions of that species, all authentic material of which is lost.

Habitat.—Texas, Kentucky, Eastern United States, West Indies.

RECURVARIA CRISTATELLA Chambers.

Gelechia cristatella CHAMBERS, Conn. Quart. Journ. Sc., II, 1875, p. 241; Bull. U. S. Geol. Surv., IV, 1878, p. 142.—RILEY, Smith's List Lep. Bor. Am., No. 5346, 1891.

Gelechia (Eragora) cristatella WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, pp. 179, 182.

Recurvaria cristatella BUSCK, Dyar's List Amer. Lep., No. 5604, 1903.

Type No. 449 in the U. S. National Museum, received from Chambers, is identical with four types examined by the writer in the Museum of Comparative Zoology.

The former is a male and has the yellow hair pencil on hindwing; so have the males in Cambridge. No other specimens are known to me.

Habitat.—Kentucky.

RECURVARIA NIGRA, new species.

Recurvaria nigra BUSCK, Dyar's List Amer. Lep., No. 5605, 1903.

Antennæ black, with indistinct narrow silvery annulations. Labial palpi with second joint black except at apex, which is silvery white; terminal joint white, with two broad black annulations; extreme tip white.

Face, head, and thorax black, with purplish reflections. Ground color of forewings silvery white, but so thickly overlaid with black and dark fuscous scales as to appear black to the naked eye. Under a lens is indistinctly seen six deep black spots of raised scales in two rows, one above, the other below fold. At apical fourth is a very narrow, irregular, V-shaped, silvery white fascia, with the angle pointed toward the tip of the wing, and farther out toward apex is a very indistinct thin row of white scales, parallel with the costal edge and meeting a similar line parallel to the dorsal edge just before apex. Cilia dark gray. Hindwings nearly black, with metallic luster. Legs black, with white annulations; tuft on posterior tibiæ silvery white.

Alar expanse.—11 mm.

Habitat.—District of Columbia.

Type.—No. 6356, U.S.N.M.

The larva feeds presumably on *Hypericum fruticosum*, but was not observed. The moth was reared accidentally May 5, in a jar containing another Tineid under observation on the above plant.

TRYPANISMA Clemens.

Plate XXIX, fig. 16.

Trypanisma CLEMENS, Proc. Ent. Soc. Phila., 1860, p. 168; N. A. Tineina, 1872, p. 125.

With his usual care Dr. Clemens characterized this genus, so that it can be readily and unquestionably recognized even with the type lost.

It has the labial palpi moderate, second joint slightly thickened, with rough scales beneath, terminal joint as long as second, rather thick, but smooth and pointed. Forewings elongate, pointed; 12 veins, 7 and 8 out of 6, 3 and 4 stalked; hindwings a little narrower than forewings, apex produced, termen emarginate; 8 veins, 3 and 4 connate, 5 approximate to 4, 6, and 7 stalked.

It was interesting to discover a new species of this genus with identical habits and structure.

The two known species can be thus separated:

- Head and face white *fagella*, p. 816
- Head and face suffused with fuscous *prudens*, p. 815

TRYPANISMA PRUDENS Clemens.

Trypanisma prudens CLEMENS, Proc. Ent. Soc. Phila., 1860, p. 168; Stainton Ed. Tin. N. Am., 1872, p. 125.—CHAMBERS, Can. Ent., V, 1873, p. 188.—RILEY, Smith's List Lep. Bor. Am., No. 5589, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5606, 1903.

Trypanisma prudens CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 166.
Gelechia quinqueannulella CHAMBERS, Can. Ent., IV, 1872, p. 191; Bull. U. S. Geol. Surv., IV, 1878, p. 146.—RILEY, Smith's List Lep. Bor. Am., No. 5464, 1891.

Clemens's type is lost, but I had no difficulty in positively identifying his species by rearing the characteristic larva, which feeds on the upperside of oak leaves under a thin sheet of silk, with a safety exit to the underside of the leaf, as Clemens described.

These bred moths, now in U. S. National Museum, agree perfectly, generically and specifically with Clemens' description, and represent without doubt the species.

They were carefully compared with and found identical with Chambers' type of *Gelechia quinqueannulella* in the Museum of Comparative Zoology in Cambridge, which, furnished with Chambers' label, was found sufficiently well preserved to be easily recognizable, and which agreed with his description.

Chambers' notes on the early stages further verifies this synonymy. Chambers wrote that he was not acquainted with *Trypanisma prudens*.¹

Habitat.—Pennsylvania, District of Columbia.

¹ Can. Ent., V, p. 188.

TRYPANISMA FAGELLA, new species.

Trypanisma fagella Busck, Dyar's List Amer. Lep., No. 5607, 1902.

Antennae dark, fuscous, annulated with white. Labial palpi whitish, with a black annulation at base of terminal joint and one just before the tip. Face and head white, thorax light gray.

Ground color of forewings yellowish white, but thickly suffused with black and gray scales, so that the wings look light gray to the naked eye. At the middle of the cell is a circular group of dense black scales, followed by a patch of yellow, with only slight dark sprinkling. At beginning of costal cilia is a nearly black large outwardly directed streak, and on the dorsal side opposite a small corresponding black patch. These black markings are edged broadly on the outside with unsprinkled yellow.

Hindwing and cilia light silvery gray. Abdomen silvery gray. Legs on the outside barred with black and silvery yellow, on the inside silvery gray.

Alar expanse.—9 mm.

Habitat.—District of Columbia.

Type.—No. 6357, U.S.N.M.

The larva is similar to and feeds in the same manner as *T. prudens*, but has as food plant beech. Like the oak feeder, it pupates in a slight web on the underside of the leaf, which is drawn into a shallow fold.

The moth is generically identical with the type of the genus and resembles it in size and general appearance, but it is a much lighter species.

EPITHECTIS Meyrick.

Plate XXX, fig. 17.

Epithecis MEYRICK, Handbook Brit. Lepidoptera, 1895, p. 580.

Taygete CHAMBERS (not *Taygetis* Hübner), Can. Entomologist, V, 1873, p. 231.

Purasia CLEMENS (not Duponchel), Proc. Acad. Nat. Sci. Phil., 1860, p. 173.

Meyrick's definition of this genus is as follows:

Second joint of labial palpi thickened with rough scales beneath, terminal nearly as long as second, somewhat roughened anteriorly. Forewings elongate, pointed, 7 and 8 out of 6. Hindwings I, trapezoidal, apex pointed, termen somewhat sinuate, cilia I; 3 and 4 connate, 5 somewhat approximate, 6 and 7 stalked.

A series of *attributella* Walker (*difficilisella* Chambers), type of Chambers' genus *Taygete* was submitted to Dr. Meyrick, who unhesitatingly pronounced his genus *Epithecis* a synonym of Chambers's genus.

As, however, the name *Taygete* is preoccupied, Meyrick's later name will stand, and the genus must be included in the American fauna.

I have not personally examined any European species of the genus,

but that is superfluous after such an authoritative determination. Some of the American species have a tendency for veins 3 and 4 in hindwing to become short-stalked instead of connate and have the discal vein nearly obsolete. Some of the species present a character, which is noteworthy and which I do not know whether it is found in the European forms—at least, it is not noted by Mr. Meyrick in his generic synopsis—namely, the long-stalked veins 6 and 7 in the hindwing, which both go to the costal edge, not, as might be expected, inclosing the apex.

I am acquainted with the following species, which may be separated thus :

Forewings with black dash at tornus	4 <i>subsimella</i> , p. 819
Forewings without such dash	1
1. Entire wing overlaid with dark scales	2
Wing light with dark spots	3
2. Forewings with transverse markings	<i>gallagenitella</i> , p. 819
Forewings without such	<i>syloicolella</i> , p. 818
3. Ground color whitish gray	<i>attributella</i> , p. 817
Ground color yellowish	4
4. Apical part of forewings light	<i>bicostomaculella</i> , p. 817
Apical part of forewings dark	<i>sauundersella</i> , p. 819

EPITHECTIS ATTRIBUTELLA Walker.

Gelechia attributella WALKER, Cat. Lep. Brit. Mus., XXIX, 1864, p. 593.—WALSINGHAM, Trans. Amer. Ent. Soc., Phila., X, 1882, p. 182.—RILEY, Smith's List Lep. Bor. Am., No. 5315, 1891.

Evagora difficilisella CHAMBERS, Can. Ent., IV, 1872, p. 65.

Gelechia difficilisella CHAMBERS, Can. Ent., IV, 1872, p. 192; V, 1873, pp. 187–188; Bull. U. S. Geol. Surv., IV, 1878, p. 142.

Taygete difficilisella CHAMBERS, Can. Ent., V, 1873, p. 231; VII, 1875, pp. 105, 106; Cinn. Quart. Journ. Sci., II, 1875, p. 289; Can. Ent., VIII, 1876, p. 19.

Epitheetis attributella BUSCK, Dyar's List Amer. Lep., No. 5608, 1903.

Two of Chambers's types of *Gelechia difficilisella* (type no. 444) and specimens thus determined by Lord Walsingham are in the U. S. National Museum. They agree well with Chambers' description and were found identical with Chambers' types in the museum in Cambridge.

Lord Walsingham established the synonymy with Walker's species.

It is a very common species, collected by the writer in numbers on trunks of trees in Washington, District of Columbia.

Other specimens in the U. S. National Museum bear the following locality labels: Virginia, Maryland, Pennsylvania, and New York; the types came from Kentucky.

EPITHECTIS BICOSTOMACULELLA Chambers.

Gelechia bicostomaculella CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 127; IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5322, 1891.

Epitheetis bicostomaculella BUSCK, Dyar's List Amer. Lep., No. 5609, 1903.

Not *Gelechia bicostomaculella* DIETZ, Smith's List Ins. N. Jersey, 1900, p. 474; BUSCK, Dyar's List Amer. Lep., No. 5755, 1903.

Chambers had named another species *Depressaria bicostomaculella*¹ before describing this species, but changed that name later to *quercifoliella*,² when he discovered its food plant. This change was, of course, inadmissible, and the name *bicostomaculella* must be retained for that species, which is a true *Gelechia*, common in the Eastern States (p. 879). This, however, need not now interfere with the name of the present Colorado species, when it is transferred to *Epithectis*, to which genus it was found to belong on examination of the type in the Museum of Comparative Zoology in Cambridge.

It is a very distinctly recognized species, of which, besides the type, I have seen only few specimens in Dr. Dietz's collection from Colorado like the type, and in U. S. National Museum from Arizona, collected by Messrs. E. A. Schwarz and H. S. Barber.

EPITHECTIS SYLVICOLELLA, new species.

Epithectis sylvicolella BUSCK, Dyar's List Amer. Lep., No. 5610, 1903.

Antennæ dark fuscous, very indistinctly lighter annulated.

Labial palpi dark brown, second joint with apex and a narrow annulation below apex white; terminal joint with tip and two annulations white.

Face and head whitish, flecked with light brown.

Forewings, ground color white, thickly overlaid with dark fuscous. Three costal spots dark brown, nearly black, one at base, one just before the costal cilia, and one midway between these.

At the beginning of costal cilia is a whitish spot less overlaid with fuscous than the rest of the wing, and opposite on the dorsal margin is a similar but smaller spot. At basal third of dorsal margin is a short, transverse, oblique dark streak reaching the fold, on which it widens out to a small dark spot, sometimes more prominent than the streak and edged exteriorly with a few white scales.

On the middle of the disk is a blackish oblong dot edged with white, and at the end of the disk is a similar rather more prominent dot. Between and immediately below these dots is an oblong, longitudinal, dark-brown streak. At base of cilia, around costal, apical, and dorsal edge, is a row of equidistant dark-brown spots. Cilia yellowish fuscous. Hindwing light gray, with bluish reflections. Cilia yellowish. Legs yellowish, tarsi annulated with black.

Alar expanse.—15 mm.

Type.—No. 6358, U.S.N.M.

Habitat.—New York.

The types of this species were found in Fitch's collection, now in

¹Can. Ent., IV, p. 127.

²Idem., IV, p. 202.

the National Museum, and were labeled in his handwriting *Anacampsis sylvicolella*; hence the name.

EPITHECTIS SUBSIMELLA Clemens.

Parasia? subsimella CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 173; Stainton Ed. N. Am. Tin., 1872, p. 137.

Parasia subsimella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 160.—RILEY, Smith's List Lep. Bor. Am., No. 5588, 1891.

Epitheatis subsimella BUSCK, Dyar's List Amer. Lep., No. 5611, 1903.

Clemens' type is lost, but his generic characterization of this species shows that it must belong to the present genus.

A specimen in the U. S. National Museum, labeled by Lord Walsingham *Gelechia consinusella* Chambers, and which has a striking external similarity to that species, *Aproaerema consinusella*, p. 844, but which on examination was found to be an *Epitheatis*, I have with but slight hesitation determined as the present species, with the description of which it agrees in all particulars.

EPITHECTIS SAUNDERSELLA Chambers.

Gelechia saundersella CHAMBERS, Can. Ent., VIII, 1876, p. 173; Bull. U. S. Geol. Surv., IV, 1878, p. 147.—RILEY, Smith's List Lep. Bor. Am., No. 5476, 1891.

Epitheatis saundersella BUSCK, Dyar's List Amer. Lep., No. 5612, 1903.

A specimen with Chambers' label on the pin is in the U. S. National Museum, which I have compared and found identical with Chambers' types in Cambridge Museum. It is a very small, conspicuously spotted species, easily recognized from the description. I have seen no other specimen, and I refer it with some hesitancy to the present genus, not being able to ascertain the venation with absolute certainty.

Habitat.—Kentucky.

EPITHECTIS GALLÆGENITELLA Clemens.

Gelechia gallægenitella CLEMENS, Proc. Ent. Soc. Phila., II, 1864, p. 420; Proc. Ent. Soc. Phila., III, 1865, p. 506; Stainton Ed. Tin. N. Am., 1872, pp. 242, 259.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 143.—RILEY, Smith's List Lep. Bor. Am., No. 5376, 1891.—DIETZ, Smith's Ins. N. Jersey, 1900, p. 474.

Gelechia geminella RILEY, Can. Ent., III, 1871, p. 195.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 143.—RILEY, Smith's List Lep. Bor. Am., No. 5379, 1891.

Epitheatis gallægenitella BUSCK, Dyar's List Amer. Lep., No. 5613, 1903.

Not *geminella* Linnaeus.

The type of this species is lost, but I have no doubt it is the same species that Riley thought was the European *Stenolechia gemmella* Linnaeus. Both were bred from Cynipid galls on oak, and Clemens' description exactly fits Riley's specimen now in U. S. National Museum. There are also other specimens, bred by Miss Murtfeldt and by the writer from the same kind of galls.

Habitat.—Illinois, Missouri, District of Columbia.

PARALECHIA, new genus.

Plate XXX, fig. 18.

Antennæ simple, rather thick, three-fourths as long as forewing. Labial palpi moderate, curved, ascending; second joint somewhat thickened beneath with rough scales; terminal joint shorter than second, pointed. Forewings elongate, ovate; apex bluntly pointed, dorsal edge slightly sinuate at vein 2; 12 veins, 7 and 8 stalked to costa, 6 separate; 3, 4, and 5 long approximate from end of cell, 2 distant shorter.

Hindwings narrower than forewings, elongate trapezoidal, termen slightly sinuate below apex; 8 veins, 6 and 7 parallel, 5 approximate to 4, 3 and 4 connate or short stalked.

Forewings with raised scales.

Only the following two species are at present known:

Forewings white and black *crisifasciella*, p. 820
 Forewings brown *pinifoliella*, p. 820

PARALECHIA PINIFOLIELLA Chambers.

Gelechia pinifoliella CHAMBERS, Journ. Cinn. Soc. Nat. Hist., II, 1880, p. 181.—
 COMSTOCK, Rep. U. S. Ent. Comm., V, 1890, p. 793, fig. 269.—RILEY, Smith's
 List Lep. Bor. Am., No. 5448.

Aristotelia pinifoliella DIETZ, Smith's List Ins. N. Jersey, 1900, p. 475.

Paralechia pinifoliella BUSCK, Dyar's List. Amer. Lep., No. 5614, 1903.

Chambers type (No. 458) and a large bred series of this common moth are in the U. S. National Museum.

Habitat.—Atlantic States.

PARALECHIA CRISTIFASCIELLA Chambers.

Gelechia crisifasciella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, pp. 87, 142.—
 RILEY, Smith's List Lep. Bor. Am., No. 5347, 1891.

Gelechia (Pecilia) inscripta WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882,
 p. 180.

Gelechia inscripta RILEY, Smith's List Lep. Bor. Am., No. 5390, 1891.—DIETZ,
 Smith's List Ins. N. Jersey, 1900, p. 474.

Paralechia crisifasciella BUSCK, Dyar's List Amer. Lep., No. 5615, 1903.

In the Museum of Comparative Zoology in Cambridge there are two types of *crisifasciella*, received from Chambers and in good condition. They show conclusively that this species is the same as Walsingham's *inscripta*, an authentic specimen of which, labeled by the author, is in the U. S. National Museum. The descriptions also agree.

I have repeatedly bred this species from oak, where the larva and pupa are found between leaves spun together, but have unfortunately no serviceable description of the larva.

The moth from overwintered pupæ appears in April, and in July another generation is found as imago.

Habitat.—Eastern United States, Missouri, Kentucky.

PHTHORIMÆA Meyrick.

Plate XXX, fig. 19.

Phthorimæa MEYRICK, Entom. Mo. Mag., XXXVIII, 1902, p. 103.

Dr. Edward Meyrick has been so kind as to publish this well-founded genus, which has *Gelechia operculella* Zeller as type, in advance of his paper, so that it could be included in this revision.

It has the following characters: Labial palpi long, curved; second joint with heavy divided brush beneath; terminal joint nearly as long as second, somewhat thickened, with appressed scales, especially at base; apex pointed.

Forewings elongate ovate pointed; 12 veins, 7 and 8 stalked to costa, rest separate; hindwings as broad as forewings, apex pointed, termen sinuate below apex; 8 veins; 6 and 7 separate parallel, 5 nearest 4, 3 and 4 connate. In the males the basal half of costal edge forms a broad, shallow fold in which a large, expansible bunch of long, scale-like hairs find place when the insect is at rest.

The recognized American species may be separated thus:

- With longitudinal black streaks on forewings *striatella*, p. 822
- Without such streaks 1
- 1. With dark marking on outer half of costal edge *marmorella*, p. 823
- Without such markings 2
- 2. With distinct longitudinal ochreous streaks *operculella*, p. 821
- Without such streaks *glochinea*, p. 822

PHTHORIMÆA OPERCULELLA Zeller.

Gelechia terrella WALKER (not FISCHER v. RÖSTERSTAMM), Cat. Lep. Ins. Brit. Mus., XXX, 1864, p. 1024.

Gelechia (?) *Bryotropha*) *operculella* ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 262.

Gelechia operculella, CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5434, 1891.—HOWARD, U. S. Dept. Agr., Farmers' Bull., No. 120, 1900, p. 23.

Bryotropha solanella BOISDUVAL, Journ. Soc. Cent. Hort. de France, 1874, VIII, p. 713.

Gelechia tabacella RAGONOT, Bull. Soc. Ent. France, 1879.

Gelechia solanella STAUDINGER and REBEL, Cat. Lep. Europ., II, No. 2636, 1901.

Phthorimæa operculella MEYRICK, Ent. Mo. Mag., XXXVIII, 1902, p. 103.—BUSCK, Dyar's List Amer. Lep., No. 5616, 1903.

While studying Zeller's types in the Museum of Comparative Zoology in Cambridge, during May, 1900, I decided that his *Gelechia operculella* was the same as the common tobacco and potato feeding Tineid, which had hitherto passed under the name *solanella* Boisduval. Zeller's types in Cambridge, which are in fine condition, leave no doubt thereon, and his description and figure further substantiate it.

However, I did not at the time wish to change the name of so well-known an insect entirely on my own observation, but was able, through the kindness of Mr. S. Henshaw, to submit one type (male) to Mr. E.

Meyrick, who, by return mail, pronounced it to be *solanella* Boisduval, which name must fall for the earlier one of Zeller.

Zeller described two females, which he associated with this species with some doubt; it seems evident from his remarks that these two female "types" are really another species, as Zeller himself surmised. They are, with one male, in the collection of Lord Walsingham.

The species, which likely has its original home in America, is now introduced in Europe, Africa, and Australia, and is of some economic importance, owing to the damage to tobacco and potato crops accomplished by it.

The different life modes on the two food plants, as leaf miner on tobacco and as borer in the potato, are equally well known and have been the subject of a large amount of literature in economic entomology, references to which are not attempted here. Among the most important are those of Dr. L. O. Howard.¹

In the U. S. National Museum are bred specimens compared by the writer with Zeller's types and many specimens determined by Lord Walsingham as *Gelechia solanella* Boisduval, besides a very large series bred from tobacco and potato in the insectary of U. S. Department of Agriculture.

PHTHORIMÆA GLOCHINELLA Zeller.

Gelechia glochinella ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 263, pl. III, fig. 18.—CHAMBERS, Bull. U. S. Geol. Surv., III, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am.

Gelechia solaniella CHAMBERS, Can. Ent., V, 1873, p. 176; Cinn. Quart. Journ. Sci., II, 1875, p. 239.

Gelechia cinerella MURTFELDT, Can. Ent., XIII, 1881, p. 244.

Gelechia inconspicuella MURTFELDT, Can. Ent., XV, 1883, p. 139.

Gelechia piscipellis RILEY (not ZELLER), Smith's List Lep. Bor. Am., No. 5450, 1891.

Phthorimæa glochinella BUSCK, Dyar's List Amer. Lep., No. 5617, 1903.

This is the smaller and plainer species bred by Miss Murtfeldt from *Solanum* and mixed up by Chambers with his *similiella* (p. 779). In the U. S. National Museum is a specimen named by Lord Walsingham *Gelechia glochinella*; also a large bred series received from Miss Murtfeldt.

The male genitalia as figured by Zeller is the surest distinguishing character from the preceding very similar species.

PHTHORIMÆA STRIATELLA Murtfeldt.

Eucatoptus striatella MURTFELDT, Can. Ent., XXXII, 1900, p. 163.

Phthorimæa striatella BUSCK, Dyar's List Amer. Lep., No. 5618, 1902.

Lord Walsingham determined this insect generically for Miss Murtfeldt and placed it in his West Indian genus *Eucatoptus*, but even if

¹ Insect Life, IV, p. 239, and Report United States Department of Agriculture, 1898, p. 137.

that genus would hold (p. 794) the present species could not be included, as it differs from Walsingham's characterization both in palpi and wing structure.

Types, received from Miss Murtfeldt (Missouri), are in U. S. National Museum, where there is also a large series bred from *Solanum* by Mr. D. W. Coquillett in Los Angeles, California.

PHTHORIMÆA MARMORELLA Chambers.

Gelechia marmorella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 239; Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 54061, 1891.

Phthorimæa marmorella BUSCK, Dyar's List Amer. Lep., No. 5619, 1903.

Two types of this species in poor condition are in the Museum of Comparative Zoology. They show it to be a species of *Phthorimæa* different from any other recognized species. I have not met with other specimens.

Habitat.—Kentucky.

GNORIMOSCHEMA Busck.

Plate XXX, fig. 20.

Gnorimoschema BUSCK, Proc. U. S. Nat. Mus., XXIII, 1900, p. 227.

Antennæ simple; labial palpi long curved, second joint large, with a well-developed, furrowed brush beneath; terminal joint shorter than second, more or less thickened with scales except at extreme tip, which is pointed and thin, laterally compressed,¹ front sharp, sometimes slightly serrate. Maxillary palpi obsolete. Tongue moderate scaled at base.

Anterior wings narrow, elongate, somewhat sinuate below apex, which is bent slightly downward.

Posterior wings a little broader than anterior wings; costa deflected downward from the middle of the wing; apex produced, termen sinuate, tornus rounded, dorsal edge straight.

Venation.—Forewings: 12 veins, 7 and 8 stalked, the rest separate. Hindwings: 8 veins, 3 and 4 connate, 5 approximate to 4, 6 and 7 parallel.

The species recognized as belonging to this genus may be separated by the following table:

With dorsal edge distinctively darker than costal edge.....	1
Dorsal edge not darker than costal edge	3
1. Head and palpi, pure white	<i>terraccottella</i> , p. 835
Head and palpi, not pure white.....	2
2. Dorsal edge, blackish	<i>serratipalpella</i> , p. 829
Dorsal edge, not blackish.....	<i>florella</i> , p. 832

¹ This is a better description than the original, given of third joint of the labial palpi; it is not scales, but the joint itself, which projects above the thickened part.

3. Dorsal edge, distinctly lighter than costal edge	4
Dorsal edge, not lighter than costal edge	10
4. Head unmottled brown	<i>baccharisella</i> , p. 825
Head not unicolorous brown	5
5. Head and palpi, whitish	6
Head and palpi, dark mottled	9
6. Ground color of forewing, light ochreous	<i>pallidochrella</i> , p. 828
Ground color, not ochreous	7
7. Forewings with dark streak on fold	<i>gallasteriella</i> , p. 825
Forewings without such streak	8
8. Costal half of forewings, nearly unicolorous	<i>albimarginella</i> , p. 827
Costal half of forewings, not unicolorous	<i>semicyclionella</i> , p. 828
9. Base of forewings, clear yellowish brown	<i>coquilletella</i> , p. 826
Base of forewing, not yellowish brown	<i>gallæsolidaginis</i> , p. 824
10. Forewings with large scale tufts on dorsal half	<i>audiella</i> , p. 828
Forewings without scale tufts	11
11. Forewings with ocellate spots	12
Forewings without ocellate spots	14
12. Forewings with transverse fascia near base	<i>octomaculella</i> , p. 830
Forewings without such fascia	13
13. Forewings with longitudinal ochreous streaks	<i>ochreostrigella</i> , p. 831
Forewings without such streaks	<i>triocellella</i> , p. 830
14. Forewings with two oblique black lines crossing at basal third	<i>lavernella</i> , p. 833
Forewings without such lines	15
15. Forewing with longitudinal streaks	16
Forewing without longitudinal streaks	17
16. Streaks light yellow; two large black spots on disk	<i>collinæusella</i> , p. 831
Streaks red; no large discal spots	<i>saphirinella</i> , p. 832
17. Ground color, whitish	18
Ground color, not whitish	19
18. Forewings uniformly dotted with dark scales	<i>tetradymiaella</i> , p. 834
Forewings not uniformly dotted with dark scales	<i>batanella</i> , p. 833
19. Forewings nearly unicolorous	20
Forewing strongly mottled	<i>banksiella</i> , p. 832
20. Forewings, brown	<i>pedimontella</i> , p. 829
Forewings, fuscous	<i>scutellariella</i> , p. 834

GNORIMOSCHEMA GALLÆSOLIDAGINIS Riley.

Gelechia gallæsolidaginis RILEY, Mo. Rep. Nat. Inst., I, 1869, p. 173; II, 1870, pp. 20, 132, 134; Smith's List Lep. Bor. Am., No. 5377, 1891.—CHAMBERS, Can. Ent., VIII, 1876, p. 19; IX, 1877, p. 14; Cinn. Quart. Journ. Sci., II, 1875, p. 289; Bull. U. S. Geol. Surv., III, 1877, pp. 1, 28, 141; IV, 1878, pp. 115, 143.—KEL LICOTT, Can. Ent., X, 1878, p. 201.—DIETZ, Smith's List Inst. N. Jersey, 1900, p. 474.

Gnorimoschema gallæsolidaginis BUSCK, Proc. U. S. Nat. Mus., XXIII, 1900, p. 227; Dyar's List Amer. Lep., No. 5620, 1903.

Riley's type is still in perfect condition in the U. S. National Museum under type no. 452.

The species is recorded from Missouri (Riley), Colorado (Chambers), Michigan and New York (Kellicott), New Jersey (Beutenmüller), and has been reared repeatedly in large series by the writer in the District of Columbia and surrounding country.

Larva in stem-galls on *Solidago*. Imagos issue during autumn (September) and also overwinter.

GNORIMOSCHEMA GALLCEASTERIELLA Kellicott.

Gelechia gallceasteriella KELLICOTT, Can. Ent., X, 1878, p. 203.—RILEY, Smith's List Lep. Bor. Am., No. 5378, 1891.

Gelechia galladiplopappi FYLES, Can. Ent., XXII, 1890, p. 248.—RILEY, Smith's List Lep. Bor. Am., No. 5375, 1891.

Gnorimoschema gallceasteriella BUSCK, Dyar's List Amer. Lep. No. 5621, 1903.

An authentic bred specimen received from Mr. Kellicott is in the U. S. National Museum. Authentic bred specimens of *galladiplopappi* were kindly sent me by Rev. Dr. Fyles; they show this species to be the same as Kellicott's, as descriptions and food plant would indicate. It is like the foregoing, a large, somewhat variable, but easily recognized species, which is about as common around Washington as *gallæsolidaginæ*.

Habitat.—Michigan (Kellicott), Canada (Fyles), District of Columbia (Busck).

Larva feeds during summer in stem-gall on various species of *Aster*. Imagos issue during autumn and also overwinter.

GNORIMOSCHEMA BACCHARISELLA, new species.

Gnorimoschema baccharisella BUSCK, Dyar's List Amer. Lep., No. 5622, 1903.

Antennæ reddish brown, each joint with tip and two small dots on the middle above black. Labial palpi of pronounced *Gnorimoschemat* form, reddish white with black shading on the outside of the second joint and at base and near tip of the terminal joint; extreme tip whitish.

Face, head, and thorax light clay brown, unmottled; basal one-sixth of forewings concolorous with thorax, with a small dark brown dot below costa at extreme base. In some specimens this yellow-brown color is continued, gradually fainter, along dorsal edge below fold. The rest of the wing is ochreous, thickly overlaid with dark fuscous scales, most numerous on the costal middle part of the wing and gradually becoming fewer toward apex, where the dark scales form narrow ill-defined longitudinal streaks on the yellow ground color. In the middle of the disk is a short oblong dark reddish-brown spot with black center, and at the end of the cell is a similar nearly moon-shaped spot.

Below the former on the fold are in some specimens a similarly colored reddish longitudinal spot.

There is some variation in the intensity of these spots and dark markings, some specimens appearing to the naked eye light reddish yellow with dark irregular longitudinal lines, while others appear dark

fuscous with narrow light streaks; around apical edge are a few blackish dots.

Hindwings shining silvery, cilia yellowish.

Abdomen robust, reddish yellow; females with stout straight protruding transparent ovipositor. Legs rather short, reddish white, shaded on the outside in irregular patches with black; tarsi blackish, with extreme tip of each joint white.

Alar expanse.—11–20 mm., the average size being 16 to 17 mm.

Habitat.—California.

Food plant.—*Baccharis pilularis*.

Type.—No. 6359, U.S.N.M.

Described from many specimens in perfect condition, bred and mounted by Mr. Koebele.

From Mr. Koebele's notes in the U. S. Department of Agriculture it is learned that he found the larvæ abundantly near San Francisco and in Berkeley County, California, in June on *Baccharis pilularis*. The larva makes a gall on the stem, and, according to Koebele, "they leave the galls when mature in the latter part of July and pupate in a case of silk in the sand."

It is not indicated in the notes whether this was under natural conditions or in his breeding cage. The moths issued September 15 to 26.

GNORIMOSCHEMA COQUILLETTELLA Busck.

Gnorimoschema coquilletteella Busck, Proc. U. S. Nat. Mus., XXV, 1902, p. 405; Dyar's List Amer. Lep., No. 5623, 1903.

Antennæ dark brown, with narrow silvery white annulations. Labial palpy of typical form; second joint whitish, sprinkled with brown scales and with a black bar on the outside; terminal joint black with a white annulation round the middle.

Face whitish; head and thorax whitish, heavily overlaid with dark brown.

Basal fifth of forewing light yellowish brown, which color is continued in a downward-curved streak along basal half of dorsal edge and sharply limited toward the rest of the wing. The ground color in the rest of the wing is pale bluish white, each scale tipped with black.

Adjoining the basal fawn-colored part is a costal semicircular region, heavily overlaid with dark fuscous, and outside this is another similar dark costal spot, not so well defined. In the first of these dark semicircles on the middle of the cell is a dark reddish brown dot surrounded with a few fawn-colored scales, and below the second costal semicircle at the end of the cell is another similarly edged spot. A few dark fuscous scales are sprinkled irregularly over the apical part of wing and the extreme apex is dark fuscous. Hindwing silvery fuscous,

darker along costa and toward the tip; cilia yellowish. Abdomen dark shining fuscous; legs whitish, shaded with dark fuscous.

Alar expanse.—11.5 to 14 mm.

Habitat.—California.

Food plant.—*Aplopappus pinifolius*.

Type.—No. 6288, U.S.N.M.

Described from many specimens bred by Mr. Koebele and Mr. Coquillett.

This species resembles in general appearance the foregoing *baccharisella* Busck, but it is a smaller and neater colored insect, and easily distinguished by the mottled head and the clearer, lighter basal area.

Both are nearly related to the type of the genus.

I take pleasure in naming this species after Mr. D. W. Coquillett, who has generously given me his notes on this and a few other Californian Gelechiidae.

Mr. Koebele's note on this insect is as follows:

Collected on *Biglora*? in the beginning of March, at Los Angeles, California, quite a number of larvæ, which spin the young leaves in the top together, so that it resembles a gall; in this they live, boring down into the stem half an inch to an inch, resembling in habits the *Pedisca* in tips of *Solidago*.

The larvæ, when full grown, left their tips and spun a cocoon on top of the ground; also on the side of the glass and on leaves.

Mr. Coquillett has kindly given me the following description of the larva from his notes:

Head yellowish brown, marked on each side with two blackish dots, of which the posterior one is nearly hidden by the first segment of the body; body dull pinkish white, sometimes tinged with brown on dorsum of abdomen; cervical shield pale yellowish; piliferous spots light colored; spiracles and anal plate concolorous with body; length, 10 mm.

Lives in a thin-walled oblong gall about 12 mm. long, formed of the undeveloped terminal bud on *Aplopappus pinifolius*. Several galls, each containing a single larva, were found March 7, 1886, near Los Angeles, California; one of these larvæ pupated April 16 and the moth issued May 18. During the following year a gall containing a larva was found in the same locality, April 9, and the moth issued June 12.

GNORIMOSCHEMA ALBIMARGINELLA Chambers.

Gelechia albimarginella CHAMBERS, Conn. Quart. Journ. Sci., II, 1875, p. 291.

Gelechia albomarginella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 141.—

RILEY, Smith's List Lep. Bor. Am., No. 5305, 1891.

Gnorimoschema albimarginella BUSCK, Dyar's List Amer. Lep., No. 5624, 1903.

The unique type, labeled by Chambers in the Museum of Comparative Zoology, Cambridge, which, though not spread, is in fairly good condition, agrees with his description, and shows that the species belongs in this genus.

No other specimen is at present known to me.

Habitat.—Colorado.

GNORIMOSCHEMA SEMICYCLIONELLA, new species.

Gnorimoschema semicyclionella BUSCK, Dyar's List. Amer. Lep., No. 5625, 1903.

Antennæ white, sharply annulated with dark chocolate brown. Labial palpi whitish, suffused with brown except tip and annular around middle of terminal joint, which are clear white. Face and head white, lightly sprinkled with brown scales; thorax darker, more liberally sprinkled with brown. Forewings white with a faint reddish tint, thickly sprinkled with minute bluish black atoms, each scale being tipped with black. Near base of wing is a clear, light chocolate brown patch; before middle of wing is a large chocolate brown semicircular costal spot, reaching down over the fold and edged with lighter brown and white below and with pure white toward the brown basal area. Following and adjoining this costal spot is another smaller and less well-defined semicircular brown costal spot, and toward the tip in the middle of the wing is an obscure brown patch. Cilia brownish white. Hindwing light silvery gray, darker along costa and toward the tip; cilia yellowish. Abdomen dark chocolate brown, the two first joints above velvety yellowish, and tip of male anal tuft white. Legs whitish, sprinkled and shaded with dark brown; tarsi blackish, each joint tipped with white.

Alar expanse.—12 to 14 mm.

Habitat.—Colorado, New Mexico.

Type.—No. 6360, U.S.N.M.

I am indebted to Dr. Dietz for one of the specimens from which I have described this species; another was collected by Mr. H. S. Barber at Las Vegas, New Mexico.

GNORIMOSCHEMA PALLIDOCHELLEA Chambers.

Depressaria pallidochrella CHAMBERS, Can. Ent., IV, 1872, pp. 126, 129, 147, 148; Bull. U. S. Geol. Surv., III, 1878, p. 138.—RILEY, Smith's List Lep. Bor. Am., No. 5272, 1891.

Gelechia pallidochrella CHAMBERS, Bull. U. S. Geol. Surv., 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5439, 1891.

Gnorimoschema pallidochrella BUSCK, Proc. U. S. Nat. Mus., XXIV, 1902, p. 732; Journ. N. Y. Ent. Soc., X, 1902, p. 90 note; Dyar's List Amer. Lep., No. 5626, 1903.

The unique type of this species is found in the museum in Cambridge. It is in poor condition, but shows plainly that it belongs in the present genus. I have met with no other specimen.

Habitat.—Kentucky.

GNORIMOSCHEMA DUDIELLA, new species.

Gnorimoschema dudiella BUSCK, Dyar's List Amer. Lep., No. 5627, 1903.

Labial palpi of pronounced *Gnorimoschema* form, white thickly sprinkled with black, under side of brush black. Antennæ whitish gray, annulated with black, basal joint black. Face silvery, head

and thorax bluish white, liberally sprinkled with black and dark fuscous scales. Forewings elongate slender, apex deflexed; ground color bluish white, but so thickly overlaid with black and fuscous as to appear dark, each scale being mottled with white and black or dark fuscous. On the basal and apical one-third the light color prevails so as to make these parts light pearl gray to the naked eye; the middle part of the wing appears without a lens blackish, but under a lens is disclosed the composite coloration. On the middle of the cell is a short deep black perpendicular dash slightly edged with brown scales; at the end of the cell is another similar larger oblique velvety black dash, also edged with light brown. Parallel with the dorsal edge and just within this is a row of three equidistant large tufts of erect scales. Hindwings dark fuscous, cilia a shade lighter. First two abdominal segments are light ochreous above, rest of abdomen light iridescent gray; legs light gray on the inside, black on the outside; tarsal joints slightly tipped with white.

Alar expanse.—15 to 17.2 mm.

Habitat.—Arizona.

Type.—No. 6361, U.S.N.M.

Described from two perfect females collected and spread by Mr. H. S. Barber in June and July, 1901.

GNORIMOSCHEMA SERRATIPALPELLA Chambers.

Gelechia serratipalpella CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 123; Bull. U. S. Geol. Surv., IV, 1878, p. 147.—RILEY, Smith's List Lep. Bor. Am., No. 5479, 1891.

Gnorimoschema serratipalpella BUSCK, Dyar's List Amer. Lep., No. 5628, 1903.

Type of this easily recognized species is found in the Museum of Comparative Zoology, where I have examined it and compared it with an identical specimen from Las Vegas, New Mexico, belonging to the National Museum.

I have also examined and received identical specimens from Dr. Dietz, collected at Denver, Colorado, from where Chambers' type came.

This species represent the extreme development of the genus, having the distinguishing palpal characters accentuated, as described by Chambers.

GNORIMOSCHEMA PEDMÓNTELLA Chambers.

Gelechia pedmontella CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 123; Bull. U. S. Geol. Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5444, 1891.

Gnorimoschema pedmontella BUSCK, Dyar's List Amer. Lep., No. 5629, 1903.

Chambers' type in Cambridge examined and found identical with specimens in the U. S. National Museum from Denver, Colorado, received through Dr. Dietz. The type came from Colorado. I have seen no other specimen.

GNORIMOSCHEMA TRIOCELLELLA Chambers.

Gelechia triocellella CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 127.

Gelechia triocellella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, pp. 87 and 147.—

RILEY, Smith's List Lep. Bor. Am., No. 5501, 1891.—DIETZ, Smith's List Ins. New Jersey, 1900, p. 474.?

Gnorimoschema triocellella BUSCK, Dyar's List Amer. Lep., No. 5630, 1903.

A well-preserved series of types with Chambers' written labels attached are found in the Museum of Comparative Zoology.

In the U. S. National Museum are several specimens, compared with and found identical with the types by the writer in 1900. One of these is named by Lord Walsingham; others were received from Dr. Dietz.

All are from Colorado, as also are Chambers' types.

Chambers recorded a variety from Kentucky, with which I am not acquainted.

Dr. Dietz recorded "a very close variety" from New Jersey, but I think it improbable that it really was this Western species.

It is a typical *Gnorimoschema*.

GNORIMOSCHEMA OCTOMACULELLA Chambers.

Gelechia octomaculella CHAMBERS, Conn. Quart. Journ. Sci., II, 1875, p. 291; Bull.

U. S. Geol. Surv., III, 1877, p. 128; IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5432, 1891.

Gnorimoschema octomaculella BUSCK, Dyar's List Amer. Lep., No. 5631, 1903.

The unique type of this species is in the Museum of Comparative Zoology. It is in very poor condition, so poor that I did not at all recognize the very charming species it really is and described it in manuscript from a fine specimen in National Museum, bred by Mr. Koebele. However, on final examination last January I realized this. Chambers' meager description gives a very poor idea of the true appearance of a perfect specimen.

For this reason I append my description:

Antennae reddish white, each joint annulated with black. Labial palpi of typical *gnorimoschema* form, whitish, sprinkled with black atoms; terminal joint just before the tip nearly black. Face reddish white, head and thorax reddish white, sprinkled with small dark atoms. Forewings pale rosy white, each scale tipped with black; near base of wing a transverse dark rust brown fascia, narrowly edged on both sides with light yellowish brown. (This fascia is not mentioned by Chambers, though detectable in the type.)

On middle of cell are two large circular dark rust-brown spots, one above the other, edged with lighter brown. A somewhat smaller similar spot at the end of the cell. Toward apex a few scattered all black scales; extreme apical edge black; cilia dirty white. Hindwings light silvery gray, cilia yellowish. Abdomen dark silvery fuscous except third joint, which is velvety yellow above; underside silvery

white. Legs white, sprinkled with dark brown scales; tarsi dusky with end of each joint white.

Alar expanse.—12 mm.

Food plant.—*Acamptopappus sphaerocephalus*.

According to the notes of Mr. Koebele in the U. S. Department of Agriculture:

This species forms a gall-like swelling on tips of branches of the above plant. Larva were collected at Lancaster, California, in May; moth in June 26.

As can be seen from the above description, the name *octomaculella* is not appropriate and caused only by the poor condition of Chambers' type of this exquisite little insect.

GNORIMOSCHEMA HENSHAWIELLA Busck.

Gelechia ochreostrigella CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 126.

Gnorimoschema ochreostrigella BUSCK, Dyar's List Amer. Lep., No. 5632, 1903.

Not *Gelechia ochreostrigella* CHAMBERS, Cinn. Quart. Journ. Sci., II, p. 247; Can.

Ent., X, 1878, p. 50; Bull. U. S. Geol. Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5431, 1891.

Chambers described two different insects as *Gelechia ochreostrigella*. The first one from California is a very distinct true *Gelechia*, as the type in Cambridge proves; this species will be found treated under its proper genus [p. 869].

The other species is the present, an entirely different smaller insect, three types of which were found in the Museum of Comparative Zoology, one of which, through the courtesy of Mr. S. Henshaw, was secured for the U. S. National Museum.

It is a typical easily recognized *Gnorimoschema*; I take pleasure in forming the new name required for this species in honor of my friend, Mr. Samuel Henshaw, of Cambridge.

The species bears a close resemblance to *Phthorimaea operculella* Zeller.

There is no references to this species in Chambers' Index.

No other specimens besides the three types are known to me.

Type.—No. 6362. U.S.N.M.

Habitat.—Colorado.

GNORIMOSCHEMA COLLINUSELLA Chambers.

Gelechia collinusella CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 128; Bull.

U. S. Geol. Survey, IV, 1878, p. 142, 1878.—RILEY, Smith's List Lep. Bor. Am., No. 5339, 1891.

Gnorimoschema collinusella BUSCK, Dyar's List Am. Lep., No. 5633, 1903.

The unique type of this striking species, labeled by Chambers, is in Cambridge Museum. I have examined it carefully, and it belongs without doubt to this genus.

It is an easily recognized, large, light yellow species, but I have not met with other specimens.

Habitat.—Colorado.

GNORIMOSCHEMA SAPHIRINELLA Chambers.

Gelechia saphirinella CHAMBERS, Conn. Quart. Journ. Sc., II, 1875, p. 250.

Gelechia sapharinella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 147.—RILEY, Smith's List Lep. Bor. Am., No. 5473, 1891.

Gnorimoschema saphirinella BUSCK, Dyar's List Am. Lep., No. 5634, 1903.

The two authentic types in the Museum of Comparative Zoology in Cambridge are in bad condition, but recognizable.

I have taken a few specimens of what I believe is this species at light in District of Columbia.

It was described from Colorado.

GNORIMOSCHEMA FLORELLA, new species.

Gnorimoschema florella, BUSCK, Dyar's List Amer. Lep., No. 5635, 1903.

Antennæ pale reddish with narrow deep black annulations. Labial palpi reddish white, darker and sprinkled with black on the under-side; terminal joint brick red with tip black. Face and tongue ocherous white; head and thorax pale reddish. Costal half of forewings whitish yellow sprinkled with light ocherous brown scales; dorsal half of forewings brick red. At basal third is a small black costal spot; on middle of cell is small black dot, below and nearer base another similar dot on the fold, and at the end of the cell is a third; all of these are surrounded by a cirlet of whitish scales.

A few black scales are scattered irregularly on the wing, especially in the dorsal part and around the apical edge. Hindwings shining whitish fuscous, cilia reddish. Underside of body whitish; legs ocherous, barred with black; tarsal joints black, tipped with white.

Alar expanse.—17 mm.

Habitat.—Denver, Colorado.

Type.—No. 6363, U.S.N.M.

This striking species, very distinct from any other recognized species, was received from Dr. William Dietz.

GNORIMOSCHEMA BANKSIELLA, new species.

Gnorimoschema banksiella BUSCK, Dyar's List Amer. Lep., No. 5636, 1903.

Antennæ dark fuscous with narrow silvery annulations. Labial palpi dark fuscous, nearly black, upper side of second joint and tip of terminal joint whitish. Face light silvery gray; head and thorax dull dark fuscous nearly black; forewings concolorous with thorax with two round ocherous brown spots, one on middle of cell one at end of cell. Below on fold is a similarly colored diffused oblong spot touching the first discal spot and reaching down to the dorsal edge.

Apical part of wing more or less sprinkled with white scales. Hindwings light fuscous. The two first abdominal segments velvety yellow above, rest of abdomen blackish above, light silvery fuscous below; legs dark fuscous, each joint tipped with silvery white.

Alar expanse.—12 to 13 mm.

Habitat.—Northern Atlantic States.

Type.—No. 6364, U.S.N.M.

Described from several specimens collected by Mr. Nathan Banks, after whom I have pleasure in naming this species, at Sea Cliff, New York. In the National Museum are also specimens from Essex County, New York (Kearfott), and I have seen other specimens from Pennsylvania and Massachusetts. This is presumably the species identified by Dr. Dietz as a variety of *triocellula* Chambers, to which it comes quite near. It differs, however, in the lack of the ocellate spots, and is a much darker species than *triocellula*, which also has an angulated light fascia at apical third, lacking in *banksiella*.

GNORIMOSCHEMA BATANELLA, new species.

Gnorimoschema batanella Busck, Dyar's List Amer. Lep., No. 5637, 1903.

Antennæ silvery white, with sharp black annulations; labial palpi with second joint white, overlaid with dark fuscous, especially on the outside; terminal joint white, with base and ill-defined annulus before the tip dark fuscous; face whitish; head and thorax white, liberally sprinkled with light fuscous scales; forewings white, with a faint rosy tint, irregularly and sparsely sprinkled with black scales, especially toward the edges; a rather prominent group of them is found on costa at apical third. On the middle of the disk is a small light-brown spot; another similar is at the end of the cell. On the middle of the dorsal edge is a patch of brown, and between this and apex are two other small groups of brown scales. All of these brown markings are obscure, ill defined, and not constant in all specimens. The black scales form a nearly continuous thin line at base of cilia round the apical edge. Cilia white; hindwings dark, shining fuscous; cilia yellowish; abdomen dark fuscous above, silvery white below; legs white on the outside, sprinkled with fuscous; tarsi on the outside black, with each joint tipped with white, on the inside pure white; outer spurs black, inner spurs black on the outside, white on the inside.

Alar expanse.—11.5 to 12.5 mm.

Habitat.—New Jersey.

Type.—No. 6365, U.S.N.M.

Cotypes in the collection of Mr. William D. Kearfott, to whom the U. S. National Museum is indebted for the types.

GNORIMOSCHEMA LAVERNELLA Chambers.

Gelechia lavernella CHAMBERS, Can. Ent., VI, 1874, p. 242.—RILEY, Smith's List Lep. Bor. Am., No. 5400, 1891.

Gelechia physaliorella CHAMBERS, Conn. Quart. Journ. Sci., II, 1878, p. 238; Bull. U. S. Geol. Surv., IV, 1878, pp. 117 and 146.—RILEY, Smith's List Lep. Bor. Am., No. 5447, 1891.

Gnorimoschema lavernella Busck, Dyar's List Amer. Lep., No. 5638, 1903.

No authentic specimen of *lavernella* is found in any of the American collections, but in U. S. National Museum was a specimen which had Professor Riley's label, "*lavernella*," on the pin. This specimen was evidently received from and mounted by Chambers, and agrees with bred specimens of *physalivorella*, compared with the type in Cambridge, which also exhibit the peculiar dark crossing lines on forewing described by Chambers.

I believe the two names apply to the same species.

Larva feeds in the fruits of *Physalis*.

Habitat.—Texas, Missouri (Chambers), Michigan, District of Columbia.

GNORIMOSCHEMA SCUTELLARIÆELLA Chambers.

Cleochio scutellariæella CHAMBERS, Can. Ent., V, 1873, p. 175; Bull. U. S. Geol. Surv., IV, 1878, pp. 116, 147.—RILEY, Smith's List Lep. Bor. Am., No. 5477, 1891.

Gnorimoschema scutellariæella BUSCK, Dyar's List Amer. Lep., No. 5639, 1903.

I have examined the unique type of this species in the Museum of Comparative Zoology in Cambridge. It is in poor condition, but I feel certain that it is a true *Gnorimoschema*, and the knowledge of the food plant should easily enable the recognition of this small, inconspicuous, nearly unicolorous, dark fuscous species.

Food plant.—*Scutellaria lateriflora*.

Habitat.—Kentucky.

I have not met with other specimens than the type.

GNORIMOSCHEMA TETRADYMIELLA, new species.

Gnorimoschema tetradymia BUSCK, Dyar's List Amer. Lep., No. 5640, 1903.

Antennæ dark fuscous, toward the tip whitish. Labial palpi dirty white, second joint shaded with black on the outside, terminal with a black spot at base.

Face, head, and thorax whitish, sprinkled with light fuscous. Anterior wings whitish, evenly and thickly overlaid with gray and fuscous scales giving the appearance of "pepper and salt." Toward the apex the veins are slightly indicated by nearly unsprinkled whitish thin lines, with their interspaces rather more overlaid with dark scales than the rest of the wing. Cilia ashy gray. Hindwings nearly transparent, light gray with silvery reflections; cilia yellowish. Abdomen dark shining fuscous, the two first joints velvety, yellowish above. Legs white, slightly sprinkled with dark fuscous.

Alar expanse.—15.5 to 20 mm.

Habitat.—Los Angeles, California.

Food plant.—*Tetradymia canescens*.

Type.—No. 6366, U.S.N.M.

Described from specimens bred by Mr. Koehle, from whose notes

it is learned that the larvæ live in stem-galls on the above plant and that the imagos issued September 18 to 23.

GNORIMOSCHEMA TERRACOTTELLA Busck.

Gnorimoschema terracottella Busck, Proc. U. S. Nat. Mus., XXI, 1900, p. 227, pl. 1, fig. 3, Dyar's List Amer. Lep., No. 5641, 1903.—DYAR, Proc. Ent. Soc. Wash., IV, 1901, p. 471.

This striking species is easily distinguished from all others in the genus by its pure white head and costal markings.

Food plant.—*Ica imbricata*.

Habitat.—Palm Beach, Florida (Dyar).

Type.—No. 4934. U.S.N.M.

NEODACTYLOTA, new genus.

Plate XXX, figs. 21, 22, 23.

Type, *Dactylota snellenella* Walsingham.

As observed by Lord Walsingham,¹ his species described as *Dactylota snellenella* differs in several important characters from the type of *Dactylota* Snellen (*Didactylota* Walsingham.) I am now able to add a congeneric species, and it is proper to erect a separate genus for the American forms, which have the following characters: Labial palpi long, slender, recurved; second joint slightly thickened beneath with nearly smoothly appressed scales; terminal joint much longer than second, smooth, slender-pointed. Forewings narrow, elongate ovate, pointed; 12 veins, 7 and 8 stalked to costa, rest separate. Hindwings in male as broad as forewings, bilobed, costal and dorsal edge nearly parallel, apex produced, pointed, termen deeply emarginate below apex, forming a shorter obtuse second lobe; costal vein straight, connected by short oblique crossbar to the subcostal at basal third; veins 6 and 7 stalked; cell not closed; discal vein and veins 4 and 5 obsolete, the latter only slightly indicated by faint traces. The females are unknown to me, but, according to Lord Walsingham, they have not bilobed hindwings, though termen is deeply emarginate below the apex, and the discal vein is present, as well as veins 4 and 5, which are stalked. His lordship has kindly, through Mr. J. H. Durrant, sent me a sketch of the venation of the hindwing in the female, which is reproduced. (Plate XXX, fig. 22.)

The West Indian species, *Didactylota bicolor* Walsingham, will quite surely be found not to belong to this genus, but to *Nealyda* Dietz.

At present only the following two species are recognized, which may be easily separated, thus:

Forewings light gray.....	1, <i>snellenella</i> , p. 836
Forewings dark purplish brown.....	2, <i>barberella</i> , p. 836

¹ Insect Life, 1, pp. 83, 84.

NEODACTYLOTA SNELLENELLA Walsingham.

Dactylota snellenella WALSINGHAM, Ins. Life, I, 1888, p. 83.—RILEY, Smith's List Lep. Bor. Am., No. 5210, 1891.

Didactylota snellenella WALSINGHAM, Proc. Zool. Soc. Lond., 1891, p. 522; 1897, p. 523.—BUSCK, Proc. U. S. Nat. Mus., XXIII, 1900, p. 228, pl. 1, fig. 4.

Neodactylota snellenella BUSCK, Dyar's List Amer. Lep., No. 5643, 1903.

One male cotype received from Lord Walsingham is in the National Museum, from which Plate XXX, fig. 21 is drawn.

In a letter of October, 1900, Lord Walsingham has kindly criticised my delineation of this species,¹ calling my attention to the faint traces of veins 4 and 5, which are still more noticeable in the following species [Plate XXX, fig. 23], and later he sent me the sketch of the female hindwing, which is reproduced in Plate XXX, fig. 22.

I have met with no other specimen of this species, which was described from Arizona.

NEODACTYLOTA BARBERELLA, new species.

Neodactylota barberella BUSCK, Dyar's List Amer. Lep., No. 5644, 1903.

Antennae four-fifths as long as forewings, dark purple, nearly black, with a white longitudinal scale on each joint, forming an interrupted silvery white line from base to tip. Labial palpi long, slender, recurved; second joint thickened somewhat with smooth appressed scales, purplish black, mottled with silvery white scales; terminal joint long, thin, acutely pointed, black, sprinkled with sparse white scales. Tongue robust, covered with scant silvery scales.

Face, head, and thorax dark purplish brown. Forewings narrow, pointed; basal two-thirds dark purplish brown overlaid with evenly mixed black, red, and whitish scales. At apical third is a transverse, somewhat irregular and not very clearly defined narrow white fascia, outside of which the wing is lighter reddish brown, with strong purplish reflexions. Just outside the fascia on the costal edge is a small longitudinal shining salmon red dash; cilia dark purplish gray, with sparse black scales intermixed at base.

Hindwings as broad as forewings, bilobed, termen deeply excised beneath apex, which forms the upper long narrow-pointed lobe; the lower lobe is much shorter, broad, rounded, and blunt. Color, dark shining purplish gray; cilia lighter gray.

Abdomen, above, dark purplish brown; below, sprinkled with white scales.

Legs purplish, much sprinkled with white scales; tarsi purplish black, with each joint tipped with white.

Alar expanse.—14 mm.

Habitat.—Williams, Arizona.

¹Proc. U. S. Nat. Mus., XXIII, pl. 1, fig. 4.

Type.—No. 6367, U.S.N.M.

Collected May 27, 1901, by Mr. Herbert S. Barber, after whom this interesting and beautiful species is named.

DEOCLONA, new genus.

(Type, *Deoclona yuccasella* Busck.)

Antennae four-fifths as long as forewing simple; labial palpi with second joint long, curved, cylindrical thickened with even, smoothly appressed scales, abruptly cut off at apex; terminal joint very short, less than one-fourth of second, tapering pointed. Head and thorax smooth. Forewing elongate, fully four times as long as wide, costal and dorsal edges parallel, apex rounded blunt; 12 veins, 7 and 8 stalked to costa, rest separate; 1^b shortly furcate at base. Hindwings as broad as forewings, elongate trapezoidal, costa nearly straight, slightly depressed from basal third, termen straight; apex blunt; 7 veins, 5 absent, discal vein, except a remnant of the lower end, obsolete, 3 and 4 long stalked, 6 and 7 stalked. Males and females are alike. Only the following species is at present recognized.

DEOCLONA YUCCASELLA, new species.

Deoclona yuccasella Busck, Dyar's List Amer. Lep., No. 5645, 1903.

Antennae light yellow, with narrow brown annulations. Labial palpi light yellow. Face, head, and thorax light reddish yellow, a shade darker than the forewings, which are also unicolorous light reddish yellow, without any markings. In some specimens the forewings are slightly darker and more reddish toward apex than on basal half. Cilia yellowish white. Hindwings pale silvery yellow; cilia yellowish white. Abdomen yellow; legs pale yellow, without darker annulations; tarsi and tuft on posterior tibial whitish.

Alar expanse.—16.2 to 20 mm.

Habitat.—California.

Food plant.—*Yucca whipplei*.

Type.—No. 6368, U. S. N. M.

Described from six specimens bred by Mr. Koebele. The following is his note on the larva:

The larva lives in the dry seed pods, pupating in holes eaten therein, and moth issues therefrom in May. The seed pods were collected on the foothills, 16 miles east of Los Angeles, California.

PROSTOMEUS, new genus.

Type, *Prostomeus brunneus* Busck.

Plate XXXI, Fig. 25.

Antennae $\frac{3}{4}$, simple. Labial palpi long curved, strongly laterally compressed, sharp edged; second joint thickened above and below with appressed scales, abruptly cut off at apex, sharp edged in front;

terminal joint fully as long as second joint, strongly laterally compressed, sharp edged in front and behind, thickened with smoothly appressed scales, which terminate abruptly just before apex, leaving the acute tip projecting. Maxillary palpi obsolete. Tongue robust, spiraled, scaled at base. Forewings elongate, about four times longer than broad; costal and dorsal edge parallel; apex obtusely pointed; 12 veins, 7 and 9 stalked to costa, rest separate. Hindwings broader than forewings. Costa nearly straight, parallel with dorsal edge; apex obtuse, termen hardly sinuated, tornus and dorsal angle rounded; 8 veins, 6 and 7 stalked, 5 approximate to 4, 3 and 4 connate, 2 distant.

Allied to and resembling *Glyphidocera* Walsingham, but with simple antennae and 12 veins in forewing, and easily recognized by the peculiar blade-like labial palpi.

Besides the species here described there is in the U. S. National Museum a single specimen of another species belonging to this genus, but not sufficiently well preserved to describe.

PROSTOMEUS BRUNNEUS, new species.

Prostomeus brunneus Busck, Dyar's List Amer. Lep., No. 5646, 1903.

Antennae dark reddish brown, annulated with white. Labial palpi light brown, mottled with dark-brown and black scales; terminal joint with base, an annulus round the middle and apical third black. Head and thorax dark brown. Forewings light straw colored, overlaid with reddish brown; base dark purplish brown; along middle of costa from basal fourth to apical third a dark purplish brown oblong narrow patch. On the dorsal edge a larger similar patch, projecting up in the light middle part of the wing a boot-shaped figure, with the toe on the center of the cell, and the heel midway between this and a unicolorous circular spot at the end of the cell.

The region at tornus is dark brown, and the apical veins are slightly indicated by darker brown streaks. Around apex at base of the cilia is a row of dark, purplish-brown dots. Cilia brown.

Hindwings dark steel gray, lighter toward the base; cilia a shade lighter.

Abdomen dark purplish fuscous above; entire body light reddish yellow below. Legs light brown, annulated with black; tarsi black, with tip of each joint white.

There is some variation in the shade of the brown color in the different specimens, some being more reddish, others more yellowish, but the form of the markings seems constant.

Alar expanse.—15 to 15.5 mm.

Habitat.—Florida.

Type.—No. 6369, U.S.N.M.

Described from several specimens received from Wm. Beutenmüller.

POLYHYMNO Chambers.

Plate XXXI, fig. 26.

Polyhymno CHAMBERS, Can. Ent., VI, 1874, p. 246.

This genus, of which *Polyhymno luteostrigella* Chambers is the type, has the following characters: Labial palpi recurved, very long, slender, second joint slightly thickened with smoothly appressed scales, terminal joint as long or longer than second, pointed. Forewings narrow, elongate, caudate, the costal and dorsal edge both slightly excised before the tip, which is produced and hooked a little downward, 12 veins, 7 and 8 very long-stalked; or 11 veins, 7 and 8 coincident. Hindwings nearly as broad as forewings, elongate, apex produced, termen sinuate; 8 veins, 3 and 4 shortstalked, 5 approximate to 4, 6 and 7 longstalked; transverse vein nearly obsolete.

This characteristic genus has been recorded by Lord Walsingham from the West Indies and from Africa; in America it is a southern genus attached to leguminous food plants.

Only three species have been described from this continent; these may be separated as follows:

- Forewings with longitudinal spindle formed white streak, vein 8 present..... 1
 Forewings without such streak, vein 8 absent3. *seustrigella*, p. 840
 1. Forewings with dorsal edge white *luteostrigella*, p. 839
 Forewings with dorsal edge dark *acaciella*, p. 839

POLYHYMNO LUTEOSTRIGELLA Chambers.

Polyhymno luteostrigella CHAMBERS, Can. Ent., VI, 1874, p. 247; Bull. U. S. Geol. Surv., IV, 1878, p. 161; Journ. Conn. Soc. Nat. Hist., II, 1880, p. 203, fig. 26.—BEUTENMÜLLER, Ann. Ent., V, 1889, p. 37.—WALSINGHAM, Trans. Ent. Soc. Lond., 1891, pl. VII, fig. 78; Proc. Zool. Soc. Lond., 1897, p. 77.—RILEY, Smith's List Lep. Bor. Am., No. 5586, 1891.—BUSCK, Jour. N. Y. Ent. Soc., VIII, 1900, p. 236; Dyar's List Amer. Lep., No. 5647, 1903.

Polyhymno fuscostrigella CHAMBERS, Can. Ent., VIII, 1876, p. 30.

Of this easily recognized and elegant species the U. S. National Museum possesses two specimens labeled by Lord Walsingham and a good series bred by the writer in the District of Columbia. In localities where the food plant is found this species comes readily to light.

Food plant.—*Cassia chamaecrista*.

Habitat.—Texas, Florida, District of Columbia.

POLYHYMNO ACACIELLA Busck.

Polyhymno acaciella BUSCK, Jour. N. Y. Ent. Soc., VIII, 1900, p. 235, pl. IX, fig. 1; Dyar's List Amer. Lep., No. 5648, 1903.

(This is a larger and darker species than the type of the genus, which it otherwise much resembles.

Food plant.—*Acacia farnesiana*.

Habitat.—Texas.

- *Type*.—No. 5353, U.S.N.M.

POLYHYMNO SEXSTRIGELLA Chambers.

Polyhymno sexstrigella CHAMBERS, Can. Ent., VI, 1874, p. 248; Bull. U. S. Geol. Surv., IV, 1878, p. 161.—RILEY, Smith's List Lep. Bor. Am., No. 5587, 1891.—BUSCK, Journ. N. Y. Ent. Soc., VIII, 1900, p. 236; Dyar's List Amer. Lep., No. 5649, 1903.

One specimen in the U. S. National Museum named by Lord Walsingham I have compared and found identical with Chambers' type in the Museum of Comparative Zoology in Cambridge.

The venation of this species differs from that of the type of the genus only in the forewing, where vein 8 is absent, coincident with 7, which is very nearly the case in the other species also, where the stem of the fork of 7 and 8 is very long and the branches short.

The other differences in venation mentioned by Chambers are not borne out by the specimens, and the identical wing form and other characters place the species naturally in the same genus.

Habitat.—Texas.

APROÆREMA Durrant.

Plate XXXI, fig. 27.

Aproaerema DURRANT, Ent. Mo. Mag., XXXIII, 1897, p. 221.

Labial palpi very long, curved, second joint smooth, terminal joint longer than second, pointed. Forewings narrow, elongate pointed; 12 veins, 7 and 8 stalked, 6 sometimes out of 7 near base. Hindwings narrower than forewings, elongate trapezoidal, apex produced, pointed, terminemarginate; 8 veins, 6 and 7 stalked, 3 and 4 connate, 5 approximate to 4.

Lord Walsingham pointed out¹ that the name *Anacamptis* hitherto had been applied erroneously to this genus instead of to the genus known as *Tachyptilia* Heinemann, containing the type of *Anacamptis*, *Tinea populella* Clerck, as specified by Curtis.² Mr. Durrant therefore proposed the name *Aproaerema* for the genus thus left nameless, the type of which is *anthyllidella* Hübner.

The genus is developed from *Anacamptis*, Curtis (*Tachyptilia* Heinemann), with a section of which it has great similarity in coloration, but it is easily distinguished by the sinuate hindwings.

All the species feed on leguminous plants.

I have recognized the following American species which may be separated by the table:

Forewings black or nearly so	1
Forewings lighter	4
1. Labial palpi with longitudinal white lines	2
Labial palpi without such lines	3

¹ Proc. Zool. Soc. Lond., 1897, p. 79.

² Br. Ent., 1827, Expl., pl. CLXXXIX.

2. Forewings sprinkled with bluish-white scales.....*crotolariella*, p. 841
Forewings without such light scales.....*palpiliniella*, p. 841
3. With curved white fascia on middle of forewings.....*kearfottella*, p. 842
Without such fascia.....*nigrella*, p. 842
4. Forewings ocherous white.....*nigratonella*, p. 843
Forewings fuscous.....*concinusella*, p. 844

APROÆREMA CROTOLARIELLA Busck.

Approaerema crotolariella BUSCK, Proc. U. S. Nat. Mus., XXIII, 1900, p. 226, pl. 1, fig. 2; Dyar's List Amer. Lep., No. 5695, 1903.—DYAR, Proc. Ent. Soc. Washington, IV, p. 471, 1901.

This species is very near the following, *palpiliniella* Chambers, and has even the same coloration of the palpi as that species, but it is somewhat larger and may be readily recognized by the sprinkling of bluish-white scales on the forewings.

Food plant.—*Crotolaria pumila*.

Habitat.—Palm Beach, Florida.

Type.—No. 4933, U.S.N.M.

APROÆREMA PALPILINEELLA Chambers.

Gelechia palpilineella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 252; Bull. U. S. Geol. Surv., IV, 1878, pp. 88, 145.—RILEY, Smith's List Lep. Bor. Am., No. 5442, 1891.

Approaerema palpilineella BUSCK, Dyar's List Amer. Lep., No. 5696, 1903.

The supposed types (3) of this species in the Museum of Comparative Zoology in Cambridge are in poor condition, and represent at least two species in different genera, namely, the present and what I take to be *Aristotelia minimella* Chambers (p. 802). But the characteristic coloration of the labial palpi, mentioned by Chambers, which this species has in common with the preceding, shows that the name *palpiliniella* should be applied to the present species.

It has been bred in the insectary of the U. S. Department of Agriculture from red clover, on which it folds the leaves.

These bred specimens¹ were examined by Chambers in 1879, and in the Department notebook is Chambers' note on the specimens, in which he says:

Without specimens to compare it with I am unable to determine this species, but it is one of the group of small dark brown moths of the genus *Gelechia*, closely allied to *nigrella*, *palpiannulella*,² and *palpiliniella*, Chambers; possibly it may be one of these, if indeed these species are distinct, which may admit of doubt.³

I quote this note as one striking, but by no means unique, example of the difficulties which attend the determination of many of Chambers's species. With a practically valueless specific description, with absolutely no generic (sometimes not even family) characters given,

¹ Agr. Dept., No. 185.

² *Aristotelia absconditella* Walker, see p. 801.

³ Italicized by the writer.

and with most uncertain types mostly in miserable condition, representing two genera, the present worker can readily join in Chambers' own admission that there may indeed be doubt about the species.

The only way out of the difficulty is to select arbitrarily one species as Chambers' intended species, taking care that it does not disagree with his remarks, and that it is at least reasonable that it may represent his species.

Pulpilineella is very commonly taken at light and is easily confounded with the equally common and similar *Aristotelia minimella* or with the following species. In U. S. National Museum are specimens from District of Columbia (Busck) and from New Jersey (Beutenmüller and Kearfott).

APROÆREMA NIGRELLA Chambers.

Gelechia nigrella CHAMBERS, Cinn. Quart. Journ. Sci., II, pp. 250, 252; Bull. U. S. Geol. Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5417, 1891.

Aproerema nigrella BUSCK, Dyar's List Amer. Lep., No. 5697, 1903.

Of this species there is one "type" received from Chambers in the Museum of Comparative Zoology, but it is in miserable condition (only one pair of wings) and does not agree with Chambers's description, having a narrow but very distinct white fascia at apical third. However, there is undoubtedly some variation in this point in these species, and I see no good reason not to regard it as truly representing the species, which is a somewhat larger form than the foregoing and without the palpal ornamentation common to the two preceding species.

APROÆREMA KEARFOTTELLA, new species.

Aproerema kearfottella BUSCK, Dyar's List Amer. Lep., No. 5698, 1903.

Antennæ black with narrow silvery white annulations. Labial palpi silvery white, terminal joint darker toward the tip, sprinkled with fuscous. Eyes red as in the *agrimoniella* group of the genus *Anacamptis*. Face silvery white, head and thorax iridescent dark bluish slate colored. Forewings purplish black, a conspicuous narrow curved white fascia on the middle of the wing, with the centrum for the curve at the base of the wing; no other markings on the wing proper. Cilia purplish black, with the tips of the middle part on the dorsal edge silvery white. Underside dark fuscous, with the white fascia plainly seen. Hindwings dark purplish fuscous, nearly black, especially toward the tip. Abdomen above deep bluish black, below silvery fuscous. All legs silvery white except the femora, which are purplish black; tarsi dusky.

Alar expanse.—12.5 mm.

Habitat.—New Jersey.

Type.—No. 6370, U.S.N.M.

Cotype in collection of Mr. William D. Kearfott, to whom the National Museum is indebted for the type of this striking species.

It is in size and coloration nearest and very close to the *agrimoniella* group of the following genus, *Anacampsis*, and it is only referable to the present genus on account of the sinuate hindwings.

APROÆREMA NIGRATOMELLA Clemens.

Gelechia nigratomella CLEMENS, Proc. Ent. Soc. Phila., II, 1863, pp. 11, 121; III, 1864, p. 507; Stainton Ed. N. Am. Tin., 1872, pp. 217, 224, 260.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5416, 1891.

Gelechia apicilinella CLEMENS, Proc. Ent. Soc. Phila., II, 1863, p. 120; Stainton Ed. N. Am. Tin., 1872, pp. 223, 224.

Gelechia apicineella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5312, 1891.

Parasia apicistrigella CHAMBERS, Can. Ent., IV, 1872, p. 66.

Gelechia apicistrigella CHAMBERS, Can. Ent., IV, 1872, p. 175; Bull. U. S. Geol. Surv., IV, 1878, p. 141.

Anacampsis apicistrigella DIETZ, Smith's List Insects New Jersey, 1900, p. 475.

Aproerema nigratomella BUSCK, Dyar's List Amer. Lep., No. 5699, 1903.

One of the few of Clemens' types, which is still in existence in the Academy of Natural Sciences, is the type of the present species, which was found in good condition in May, 1900, during my visit there; it bears Clemens's No. 63 on the label, corresponding to a list in his handwriting with *nigratomella* var. for this specimen.

Clemens described two varieties of this species, one with shining white forewings, the other with ochreous white wings with costal edge at base pure white; there is some slight variation in the specimens I have seen, but all have at least an ochreous tint.

Chambers's type of *apicistrigella* in the Museum of Comparative Zoology in Cambridge is identical with Clemens' species, as the descriptions would indicate.

Riley made this latter a synonym of *Gelechia apicilinella* Clemens; the descriptions do not seem to support this synonymy and I doubt its correctness, but as Clemens' type is lost it must stand for the present on Riley's authority.

This species is very close to the following, *concinusella* Chambers, having the identical ornamentation, but easily distinguished by the light groundcolor, while *concinusella* has the groundcolor of the forewing dark. Chambers says in his description of *concinusella*:¹

It may prove to be identical with *Gelechia apicistrigella* Chambers, but I think not.

Lord Walsingham evidently was in doubt whether the two were merely varieties of the same species or distinct species, as is proved

¹U. S. Geological Survey Bull., III, p. 127.

by two specimens in the U. S. National Museum which are labeled in his handwriting, respectively, "*Concinusella Cham ? = apicistrigella, dark variety,*" and "*apicistrigella Cham ? = Concinusella, light variety,*" but inasmuch as there seems to be no gradual transition between the two different forms, they must be regarded as distinct species, as I feel certain they are, until disproven by the breeding of both forms from the same kind of larva.

I have examined very many specimens of this common form, among which specimens named by Lord Walsingham in Professor Fernald's collection and bearing his blue labels no. 115, 1094, 1116, and 1033 corresponding with the identification in his notebook as *apicistrigella*.

Habitat.—Eastern United States, Kentucky, Colorado.

APROÆREMA CONCINUSELLA Chambers.

Gelechia concinusella CHAMBERS, Cinn. Quart. Journ. Sc., II, 1875, p. 253; Bull. U. S. Geol. Surv., IV, 1878, p. 142.—RILEY, Smith's List Lep. Bor. Am., No. 5340, 1891.

Gelechia concinnisella CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 127.

Aproærema concinusella BUSCK, Dyar's List Amer. Lep., No. 5700, 1903.

Type No. 448, in the U. S. National Museum, received from Chambers, as this species agrees well with description and is identical with his types in the Cambridge Museum.

This species has a notable color resemblance to *Epithectis* (*Parasia* ?) *subsimella* Clemens.

Habitat.—Texas, Colorado.

ANACAMPSIS Curtis.

Plate XXXI, fig. 28.

Type, *Tinea*, i. e. *Tinea pojulella* Clerck.

Anacampsis CURTIS, Brit. Ent., 1827, expl. pl. CLXXXIX.

Tachyptilia HEINEMANN (Meyrick, Standing and Rebel), Schmetterlinge Deutschlands u. d. Schweiz, II, 1870, p. 321.

Labial palpi very long curved, second joint thickened with smoothly appressed scales, sometimes roughened above in the middle; terminal joint longer than second, slender pointed. Abdomen somewhat flattened. Forewings elongate, apex blunt, termen very oblique; 12 veins, 7 and 8 stalked, rest separate. Hindwings as broad or broader than forewings, trapezoidal termen not sinuate, 8 veins, 3 and 4 connate, 5 parallel, 6 and 7 connate.

I have recognized the following American species as belonging to this genus:

Basal half of forewings without any markings	1
Basal half of forewings more or less mottled	8
1. Forewings without white markings	2
Forewings with white markings	3
2. Color ochreous	<i>fullonella</i> , p. 849
Color black	<i>lupinella</i> part, p. 850

3. Forewings with transverse fascia	4
Forewings without transverse fascia	6
4. Forewings with three apical longitudinal white dashes	<i>tristriella</i> , p. 851
Forewings without such dashes	5
5. Color markedly darker outside the fascia	<i>agrimoniella</i> , p. 856
Color dark on both sides of the fascia	<i>lupinella</i> , part., p. 850
6. Forewings with one costal white streak	7
Forewings with two costal white streaks	<i>levipedella</i> , p. 851
7. Color light ochreous brown	<i>pallodoriella</i> , p. 848
Color black	<i>lupinella</i> , part., p. 850
8. With large semicircular dark dorsal spot	<i>cycella</i> , p. 848
Without such spot	9
9. With dark costal spot	<i>lugunculariella</i> , p. 848
Without such spot	10
10. With face whitish	<i>argyrothamniella</i> , p. 847
Face not white	11
11. With sharp white markings	<i>niveopulvella</i> , p. 847
Markings indistinct	12
12. Groundcolor ash-gray	<i>crecensifasciella</i> , p. 846
Groundcolor brownish	13
13. Alar expanse more than 20 mm.	<i>innocella</i> , p. 845
Alar expanse less than 20 mm.	<i>rhoifrutella</i> , p. 845

ANACAMPSIS INNOCUELLA Zeller.

Gelechia (*Tachyptilia*) *innocella* ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 249.

Gelechia innocella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5389, 1891.

Anacampsis innocella BUSCK, Dyar's List Amer. Lep., No. 5701, 1903.

This species and still more the following are, as Zeller remarked, very similar to the European *Anacampsis populella* Clerck, but both have the wings more blunt.

I have examined the types of the present species in Cambridge.

In the National Museum is a series, identical with the types, bred from leaves of cottonwood received from Wyoming; also a large series bred from cottonwood in Colorado by Dr. Dyar.

The larva rolls the leaves in the same fashion as does the European *populella*.

Zeller's types are from Texas.

ANACAMPSIS RHOIFRUCTELLA Clemens.

Gelechia rhoifrutella CLEMENS, Proc. Acad. Nat. Hist. Phila., 1860, p. 163; Proc. Ent. Soc. Phila., II, 1863, p. 121; Stainton Ed. N. Am. Tin., 1872, pp. 40, 114, 225.

Gelechia rhoifrutella CHAMBERS, Can. Ent., III, 1872, p. 68; Bull. U. S. Geol. Surv., IV, 1878, p. 146.—ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 252.—COQUILLETT, Papilio, III, 1883, p. 99.—RILEY, Smith's List Lep. Bor. Am., No. 5466, 1891.

Tachyptilia rhoifrutella DIETZ, Smith's List Ins. N. Jersey, p. 474, 1900.

Gelechia (*Tachyptilia*) *consonella* ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 251.—WALSINGHAM, Trans. Amer. Ent. Soc. Phila., X, 1882, p. 183.

- Gelechia consonella* CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 142.—RILEY, Smith's List Lep. Bor. Am., No. 5338.
- Gelechia quadrimaculella* CHAMBERS, Can. Ent., VI, 1874, p. 237; Bull. U. S. Geol. Surv., IV, 1878, p. 146.—RILEY, Smith's List Lep. Bor. Am., No. 5459, 1891.
- Gelechia ochreocostella*, CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, pp. 91, 145.
- Anacampsis rhoifrutella* BUSCK, Dyar's List Amer. Lep., No. 5702, 1903.
- Not *Gelechia quadrimaculella* CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 290; Bull. U. S. Geol. Surv., III, 1877, p. 128.

Lord Walsingham has established the synonymy *rhoifrutella*=*ochreocostella*, and suggested that *consonella* Zeller was also this species. I have seen the types in the Museum of Comparative Zoology of *quadrimaculella* Chambers, *consonella* Zeller, and *ochreocostella* Chambers, and in U. S. National Museum there is a type (No. 461) of *ochreocostella* and specimens named by Walsingham, *rhoifrutella*. All of these specimens are identical and confirm Lord Walsingham's synonymy, adding that of *quadrimaculella* Chambers, as was to be expected from the description of the species.

Both of Chambers' species as well as Zeller's type came from Texas. Clemens presumably reared his in Pennsylvania.

The other species named by Chambers *quadrimaculella* and afterwards renamed *praeinominella*, is evidently an entirely different insect, which I have recognized as a species of *Gelechia*, under which genus it is treated (p. 875).

ANACAMPSIS CRESCENTIFASCIELLA Chambers.

- Gelechia crescentifasciella* CHAMBERS, Can. Ent., VI, 1874, p. 237; Cinn. Quart. Journ. Sci., II, 1875, p. 255; Bull. U. S. Geol. Surv., IV, 1878, pp. 90, 142.
- Anacampsis crescentifasciella* BUSCK, Dyar's List Amer. Lep., No. 5703, 1903.
- Not *Gelechia crescentifasciella* WALSHINGHAM, Trans. Amer. Ent. Soc. Phila., X, 1882, p. 179.

Lord Walsingham made this species a synonym of *Gelechia conclusella* Walker, but this was clearly caused by a mistake. The supposed type of *crescentifasciella* from Mr. Goodell's collection, on the strength of which Walsingham made the synonymy, is now in Professor Fernald's collection, and he has explained that by mistake this specimen was represented as the type, but that it really was not authentic. It is a specimen of *conclusella* Walker. In Lord Walsingham's notebook¹ is written under the number corresponding to his blue label on this specimen "1034, *G. conclusella* Walker=*G. crescentifasciella*, Chambers's type," but the word "type" was afterwards crossed over.

In the U. S. National Museum there is a type (No. 446) received from Chambers with his handwriting *crescentifasciella*. This type is the

¹ See preface, p. 768.

same as eight specimens in Cambridge Museum, also received from Chambers, and furnished with his label. These specimen agree with Chambers' description, and undoubtedly represent the present species, which is very different from *conclusella* Walker. One of these specimens, originally from the Salem collection, bears Walsingham's blue label no. 980, and is labeled in his handwriting "*Gelechia crescentifasciella* Chambers, but quite distinct from his type."¹

Crescentifasciella does resemble, as remarked by Chambers, *Gelechia quadrimaculella*,² "but is smaller and of a more ashen hue."

No other specimen than the types mentioned are known to me.

The supposed "type" in Professor Fernald's collection, received from Chambers through Miss Murtfeldt, is an *Elachistid*, wrongly identified.

ANACAMPSIS NIVEOPULVELLA Chambers.

Gelechia niveopulvella CHAMBERS, Can. Ent., VII, 1875, p. 210; Bull. U. S. Geol. Surv., IV, p. 1878.—RILEY, Smith's List Lep. Bor. Am., No. 5419, 1891.

Anacampsis niveopulvella, Busck, Dyar's List Amer. Lep., No. 5704, 1903.

The unique type of this species was obtained in good condition from the Belanger collection, Laval University, Quebec, where it has been since returned by Chambers in 1875. It bears Chambers' label, agrees well with his description, and is undoubtedly authentic.

It proves the species to be a large *Anacampsis* of the size of *innocella* Zeller. It has the same general pattern of ornamentation as this species, but much more pronounced in black and white. In Europe are known very similar corresponding varieties of *Anacampsis populella* Clerck, and *niveopulvella* may ultimately prove to be such a variety of *innocella*; but as it is easily recognized and markedly different from the common form of *innocella*, and as no intermediate forms are known as yet, it must be retained as a good species until proof of the identity with *innocella* is given by breeding.

In the U. S. National Museum are other specimens identical with the type from Vancouver's Island, and the northern latitude may be cause of the variety. Chambers' type came from Canada.

ANACAMPSIS ARGYROTHAMNIELLA Busck.

Anacampsis argyrothamniella BUSCK, Proc. U. S. Nat. Mus., XXIII, 1900, p. 231; Dyar's List Amer. Lep., No. 5705, 1903.—DYAR, Proc. Ent. Soc. Washington, IV, 1901, p. 474.

Type.—No. 4938, U.S.N.M.

Food plant.—*Argyrothamnina blodgettii*.

Habitat.—Palm Beach, Florida.

¹ The supposed type from Goodell's collection.

² *Anacampsis rhoifrutella* Clemens, p. 845.

ANACAMPSIS LAGUNCULARIELLA Busck.

Anacampsis lagunculariella Busck, Proc. U. S. Nat. Mus., XXIII, 1900, p. 230, pl. 1, fig. 6; Dyar's List Amer. Lep., No. 5706, 1903.—DYAR, Proc. Ent. Soc. Washington, IV, 1901, p. 474.

Type.—No. 4937, U.S.N.M.

Food plant.—*Laguncularia racemosa*.

Habitat.—Palm Beach, Florida.

ANACAMPSIS CYCLELLA, new species.

Anacampsis cyclella Busck, Dyar's List Amer. Lep., No. 5707, 1903.

Antennæ whitish yellow, annulated with black. Labial palpi whitish yellow, terminal joint toward tip fuscous. Face, head, and thorax whitish yellow. Ground color of forewings whitish yellow shaded with darker fawn. On the middle of the dorsal edge is a large, semi-circular, dark olive-brown spot, reaching to the middle of the wing and edged with white. The apical half of costal edge is of this same dark brown color, interrupted by four oblique white streaks, the first near the middle of the wing, the second at beginning of costal cilia, both directed outward. The two last streaks are smaller nearer apex and directed inward. The second costal streak is faintly continued in a thin, outwardly pointed, V-shaped fascia, at the tip of which is a longitudinal black dash, edged with white scales. Above and below this dash, outside of the faint white fascia, the wing is finely checkered with black and white scales. On the middle of the wing at the end of the cell is a small, dark brown, oblong spot. Upper half of the cilia is dark reddish brown, with base white; through this white base runs a heavy black line parallel with the edge of the wing. Lower half of cilia yellowish white. When the moth is at rest the two dorsal spots on the wings unite to form a conspicuous dark circle, edged with white. Hindwing dark olive brown, lighter and silvery toward the base; cilia golden. Abdomen and underside of thorax silvery yellow. Legs yellowish white annulated with brown; tarsi dark brown tipped with white. Alar expanse, 14 to 14.5 mm.

Habitat.—Arizona.

Type.—No. 6371, U.S.N.M.

Described from three well-preserved specimens—two collected by Mr. E. A. Schwarz, at Santa Rita Mountains, in May and June; the third collected by Mr. H. S. Barber, in July, at Williams, Arizona.

ANACAMPSIS PALTODORIELLA, new species.

Anacampsis paltodoriella Busck, Dyar's List Amer. Lep., No. 5708, 1903.

Antennæ silvery white with a heavy longitudinal dark brown line running from base to tip. Labial palpi, second joint yellowish white, terminal joint silvery white with a slender longitudinal black line in

front from base to apex. Face creamy white; head and thorax light drab colored. Forewings drab colored, lightest nearly white along the costa, gradually darker toward dorsal edge.

In the middle of the cell is a small indistinct blackish dot, a similar one nearer base on the fold and a third at the end of the cell. At apical fourth is an oblique narrow white streak directed outward and nearly meeting a similar but curved dorsal streak directed upward and outward. Both streaks are slightly edged with black anteriorly. The area between the dorsal streak and the edge of the wing is white, mottled finely with black, each scale being tipped with black. Apical cilia dark brown with base whitish and containing a heavy blackish perpendicular line; dorsal cilia yellowish white with the apical dark line continued fainter and interrupted along the edge of the wing. Hindwings dark purplish fuscous, cilia a shade lighter and with a narrow whitish line at base along the edge of the wing. Abdomen dark purplish except first two joints above which are light velvety yellow, anal tuft yellowish.

Fore and middle legs and underside of thorax deep dull brown, nearly black; tarsal joints tipped with yellow; hindlegs on the outside dark brown mottled with yellow, the inside and tuft on tibial yellow, tarsi banded with yellow.

Alar expanse.—3 mm.

Habitat.—Mesilla Park, New Mexico.

Type.—No. 6372, U.S.N.M.

A beautiful species, near the foregoing, *cyclella*, collected by Prof. T. D. A. Cockerell.

The wing pattern strongly reminds one of the *striatella* group of the genus *Pultodora*.

ANACAMPSIS FULLONELLA Zeller.

Gelechia (*Ceratophora*?) *fullonella* ZELLER, Verh. k. k. zool.-bot. gesell. Wien, XXIII, 1873, p. 276.

Gelechia fullonella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 143.—RILEY, Smith's List Lep. Bor. Am., No. 5366, 1891.

Gelechia rufusella CHAMBERS, Can. Ent., VI, 1874, p. 240; Bull. U. S. Geol. Surv., IV, 1878, p. 1474.—RILEY, Smith's List Lep. Bor. Am., No. 5472, 1891.

Gelechia (*Trichotaphe*) *refusella* WALSLINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 184.

Gelechia subrubrella CHAMBERS, Can. Ent., VI, 1874, p. 240; Cinn. Quart. Journ. Sci., II, 1875, p. 254; Bull. U. S. Geol. Surv., IV, p. 147, 1878.—RILEY, Smith's List Lep. Bor. Am., No. 5486, 1891.

Meusa rubescens WALSLINGHAM, Proc. Zool. Soc. Lond., p. 319, 1881, pl. xxxvi, fig. 9.

Anacamptis fullonella BUSCK, Dyar's List Amer. Lep., No. 5709, 1903.

The types of *fullonella* are in the possession of Lord Walsingham, to whom I am indebted for the information (in letter of May 10, 1901) that it is the same as Chambers' *rufusella*.

Of this latter species I have examined type no. 463 in the U. S. National Museum, and Chambers' types in Cambridge as well as specimens in the National Museum and in the Philadelphia Academy of Natural Sciences, determined by Lord Walsingham; they are all identical and undoubtedly represent Chambers' *rufusella*.

The supposed type of this species in Professor Fernald's collection is a very similar species of *Trichotaphe*, which I feel confident represents Chambers' *Gelechia bidiscomaculella* (p. 914).

In the U. S. National Museum are undoubted specimens of *rufusella* which, in my opinion, represent Chambers' *subrubrella*, which species Chambers himself, in his original description, suggested was only a variety of *rufusella*. As all authentic specimens of *subrubrella* are lost, and as *rufusella* is a somewhat variable species, I place the two as synonyms without much hesitation, thus disposing of an otherwise empty name.

Lord Walsingham suggested that this species is a *Trichotaphe*, but the separate veins 2 and 3 in forewings and the very long terminal joint of the labial palpi place it in the present genus.

The general habitus of the species is truly very similar to *Trichotaphe*, and it is one proof of the close relationship of the two genera.

All the specimens I have seen are from Texas.

ANACAMPSIS LUPINELLA Busck.

Anacamopsis lupinella BUSCK, Can. Ent., XXXIII, 1901, p. 14; Dyar's List Amer. Lep., No. 5710, 1903.

Type.—No. 5351. U. S. N. M.

Food plant.—*Lupinus perennis*.

Habitat.—Canada.

Since describing this species I have had the pleasure of breeding it myself from larva, kindly sent me by my friend, Mr. Arthur Gibson, Ottawa, Canada, thus obtaining more material of this interesting species.

ANACAMPSIS AGRIMONIELLA Clemens.

Gelechia agrimoniella CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, pp. 162, 434; Proc. Ent. Soc. Phila., II, 1863, p. 120; Stainton Ed. Tin. N. Am., 1872, pp. 40, 112, 224.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5301, 1891.

Gelechia (Anacamopsis) agrimoniella ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 275

Tachyptilia agrimoniella DIETZ, Smith's List Ins. N. Jersey, 1900, p. 474.

Gelechia aduncella ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XVIII, 1868, p. 614.

Gelechia adersella RILEY, Smith's List Lep. Bor. Am., No. 5299, 1891.

Anacamopsis agrimoniella BUSCK, Can. Ent., XXXIII, 1901, p. 15; Dyar's List Amer. Lep., No. 5711, 1903.

This well-known and thoroughly described species has been recorded from Pennsylvania, District of Columbia, and Georgia. In the

National Museum are also bred and collected specimens from Virginia, New York, and Kansas.

Food plant.—*Agrimonia*.

This and the following species have a marked resemblance to the *anthyllidella* group of the genus *Aproerema*, which has caused former workers (Zeller, Stainton, and Walsingham) to place it in that genus in spite of the differing wing form and venation, but they clearly belong to the present genus, and only indicate the relationship of the two genera.

ANACAMPSIS TRISTRIGELLA Walsingham.

Gelechia (*Anacampsis*) *tristrigella* WALSINGHAM, Trans. Amer. Ent. Soc. Phila., X, 1882, p. 181.—COQUILLETT, Papilio, III, 1883, p. 91.

Gelechia tristrigella COMSTOCK, Rep. U. S. Ent. Comm., V, 1890, p. 639.—RILEY, Smith's List Lep. Bor. Am., No. 5502, 1891.

Anacampsis tristrigella BUSCK, Can. Ent., XXXIII, 1901, p. 15; Dyar's List Amer. Lep., No. 5712, 1903.

Of this easily recognized species I have identified a specimen from Kansas in U. S. National Museum, which identification I subsequently had opportunity to verify by comparison with the type in Professor Fernald's collection.

Food plant.—*Corylus americana* (Coquillett).

ANACAMPSIS LEVIPEDELLA Clemens.

Strobisia levipedella CLEMENS, Proc. Ent. Soc. Phila., II, 1863, p. 4; Stainton Ed. Tin. N. Am., 1872, p. 207.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 162.—FREY, Stett. Ent. Zeit., XXXIX, 1878, p. 251.—RILEY, Smith's List Lep. Bor. Am., No. 5584, 1891.

Anacampsis levipedella BUSCK, Can. Ent., XXXIII, 1901, p. 15; Dyar's List Amer. Lep., No. 5713, 1903.

The type of this species is lost, but no doubt whatever exists about the identity of this common, striking, well-described species.

I have examined specimens determined by Chambers in the Museum of Comparative Zoology, in Cambridge, and specimens named by Lord Walsingham in the National Museum.

While this species has a certain general resemblance to the genus *Strobisia*, its structural characters place it in *Anacampsis*, in which it finds a near relative in the preceding species, *tristrigella* Walsingham.

Professor Frey's excellent description of the characteristic underside of the wings is an important addition, and emphasizes the relationship with this group.

The species is rather common around Washington City.

GELECHIA Hübner.

Plate XXXI, fig. 29.

Gelechia HÜBNER, Verz. bek. Schmett., 1816, p. 415.

Cirra CHAMBERS, Can. Ent., IV, 1872, p. 146.

Oscus CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 255.

Pseudochelaria DIETZ, Ent. News, XI, 1900, p. 252, pl. 1, fig. 3.

Labial palpi long curved, second joint more or less thickened beneath, with rough scales, sometimes with large developed brush, sometimes furrowed; terminal joint nearly as long or longer than second joint, smooth pointed. Forewings elongate pointed, with 12 veins, 7 and 8 stalked, rest separate. Hindwings nearly as broad or broader than forewings; apex pointed, termen more or less sinuate; 8 veins, 3 and 4 connate or short stalked, 5 approximate to 4, 6 and 7 approximate, connate or stalked.

Two species, namely, *conclusella* Walker and *basquella* Chambers, which have been included in the present genus, differ from this synopsis in having veins 3 and 4 in the forewings stalked, but I do not believe generic separation would be justified on that ground, as there is a tendency in allied species to have these veins approximate, or even connate (*Gelechia abdominella* Busck), and as they in all other particulars agree with the genus.

Chambers' genus *Cirrho* does not in any way differ from *Gelechia*, as examination of the type has proven.

Oeseis Chambers has very strongly developed and somewhat specialized brush on second joint of labial palpi, approaching that of *Ypsolophus*; but otherwise in general habitus, wing form, and venation it agrees well with *Gelechia* as here defined, and I do not believe it can be retained as a natural separate genus in view of the many intermediate forms found between it and normal *Gelechia* species.

Pseudochelaria Dietz has justly been made a synonym of *Gelechia* by Lord Walsingham and J. Hartley Durrant.¹

From the examination of the supposed type of Lord Walsingham's genus of that name, *pensylvanica* Dietz (Walsingham manuscript), which is now in Dr. Dietz's possession, I am unable to see why a new genus should be erected for it as Lord Walsingham suggests, and have, consequently, included that species also in the present genus. Some mistake has likely been made.

The genus *Catastega* Clemens, which was erected solely on larval food habits, I had at a time suspected to be synonymous with *Gelechia*, and it is so placed in Dr. Dyar's List of American Lepidoptera. I had reached this conclusion by breeding *Gelechia scrotinella* Busck, which has the identical and very peculiar life mode described by Clemens for the genus *Catastega*, and I surmised that Clemens' species, when bred, might turn out to belong to the same group.

Since then, however, Dr. Dyar has succeeded in breeding what must be regarded as type of Clemens' genus, the oak feeding *timidella*, and it turns out to be a Tortricid (not yet determined,² because of rubbed condition of the specimens).

¹ Ent. Mo. Mag. 1902, p. 28.

² For this reason *Catastega*, with its three species, was retained in Dr. Dyar's List of American Lepidoptera under *Gelechia*, as it was not known where else to place them.

This and the two other species, which were placed heading the list of unrecognized species of *Gelechia* have thus no place there, and need not give more trouble in this group.

Under *Gelechia* it has been necessary to place not only such species which have been recognized by the writer as belonging to the genus, but also all those species which have been described as or referred to *Gelechia*, but which at present are unknown and therefore of uncertain generic position; in fact, some of these evidently do not belong to *Gelechia*, but as their true genus can not be ascertained at present they must temporarily stand under *Gelechia* as described.

All these unplaced species I have put in section *B.*, which then merely indicates that such species are retained in the genus only on the authority of the original description. These species must of course be reckoned with when a new species is to be described in any *Gelechiid* genus. It is a tedious work, always more or less uncertain, to go over all these descriptions before one is reasonably sure not to make a synonym.

To insure myself as far as possible against this I have made for my own use a synoptic table of all these uncertain species, using such striking characters as can be gleaned from the descriptions, but even with this many descriptions must be gone over.

All species placed in section *A* can be relied upon as conforming with the definition of the genus *Gelechia* in all particulars, except when otherwise expressly remarked upon.

The following synoptic table includes only these recognized species:

Ground color black* or very dark uniform brown	1
Ground color not black or dark uniform brown.....	21
1. With head canary yellow..... <i>aristella</i> , p. 866	
Head not yellow	2
2. Forewings with white or whitish markings only.....	3
Forewing with dorsal edge rust red..... <i>basquella</i> , p. 864	
3. With head pure white.....	4
With head more or less mottled.....	14
4. With basal half of dorsal edge white.....	5
Dorsal edge not white.....	9
5. Entire dorsal edge white..... <i>paucella</i> , p. 865	
Entire dorsal edge not white.....	6
6. With oblique white fascia at apical fourth..... <i>unifasciella</i> , p. 865	
Without such fascia.....	7
7. With abdomen and legs salmon colored..... <i>abdominella</i> , p. 863	
Abdomen not salmon colored.....	8
8. With white streak on basal half of costa..... <i>sistrella</i> , p. 862	
Without such streak..... <i>dentella</i> , p. 862	
9. With thorax white.....	10
Thorax not white.....	12
10. Forewings with white fascia and costal spots..... <i>albilocella</i> , p. 861	
Forewings without such fascia and spots.....	11
11. Forewings with faint ochreous white dots on disk..... <i>minimaculella</i> , p. 867	
Forewings without such dots..... <i>thoracalbella</i> , p. 867	

12. Forewings with white markings sharply defined.....	13
White markings diffused.....	<i>continua</i> , p. 859
13. Forewings with white spot on fold.....	<i>quinella</i> , p. 856
Forewings without white spot on fold.....	<i>cercerisella</i> , p. 855
14. With dorsal edge from base to cilia white.....	<i>packardella</i> , p. 866
Dorsal edge not white.....	15
15. With white oblique costal streak at basal third.....	16
Without such streak.....	18
16. With complete white fascia at apical third.....	<i>lagubrella</i> , p. 861
Without such fascia.....	17
17. Face and second joint of labial palpi white.....	<i>coloradensis</i> , p. 857
Face and second joint of labial palpi dark.....	<i>arizonella</i> , p. 856
18. With angulate white fascia at apical third.....	19
Without such fascia.....	20
19. Basal part of forewings lighter, sprinkled with white.....	<i>trophella</i> , p. 860
Basal part of forewings not lighter than rest of wing.....	<i>bimaculella</i> , p. 859
20. Second joint of labial palpi light ochreous white.....	<i>trialbamaculella</i> , p. 858
Second joint of labial palpi dark.....	<i>confusella</i> , p. 859
21. Forewings brick red.....	<i>panella</i> , p. 889
Forewings not brick red.....	22
22. Apical edge of forewing and cilia rose.....	<i>ribesella</i> , p. 860
Forewings not rose.....	23
23. Ground color pure white.....	<i>fuscoteniella</i> , p. 890
Ground color not pure white.....	24
24. Apical third of forewings white.....	<i>abella</i> , p. 889
Apical third of forewings not white.....	25
25. Forewings with ocellate discal spots.....	26
Forewings without ocellate spots.....	28
26. Ground color dark purplish brown.....	<i>discoocellula</i> , p. 874
Ground color not brown.....	27
27. Ground color whitish gray.....	<i>bianulella</i> , p. 873
Ground color ochreous white.....	<i>obsкуроocellula</i> , p. 878
28. Forewings without any distinct markings.....	29
Forewings distinctly marked.....	31
29. Forewings dark steel gray.....	<i>anarsiella</i> , p. 874
Forewings not dark steel gray.....	30
30. Ground color light ochreous.....	<i>rileyella</i> , p. 887
Ground color grayish white.....	<i>obsкуроsuffusella</i> , p. 888
31. Dorsal edge conspicuously lighter than costal edge.....	32
Dorsal edge not lighter than rest of wing.....	34
32. Base of forewings light ochreous.....	<i>mediofusella</i> , p. 885
Base of forewings not light.....	33
33. Entire thorax light ochreous.....	<i>hibisella</i> , p. 869
Only central part of thorax ochreous.....	<i>ochrostrigella</i> , p. 869
34. Second joint of labial palpi deep black.....	35
Second joint of labial palpi not black.....	36
35. Forewings with indistinct white markings.....	<i>albisparsella</i> , p. 877
Forewings without white markings.....	<i>unctulella</i> , p. 878
36. Forewings without any transverse markings.....	37
Forewings with costal spots or other transverse markings.....	41
37. Forewings uniformly longitudinal streaked without other markings.....	38
Forewings with other markings.....	39
38. Forewings brownish.....	<i>ochrosuffusella</i> , p. 867
Forewings gray.....	<i>striatella</i> , p. 868

39. With heavy black longitudinal streak on fold.....	<i>variabilis</i> , p. 871
Without such streak.....	40
40. Forewings strongly mottled with dark fuscous spots.....	<i>undinella</i> , p. 888
Forewings without such spots.....	<i>petasitis</i> , p. 888
41. Dorsal base of forewing darker than general color of wing.....	42
Base of dorsum not darker than general color of wing.....	44
42. With angulated whitish fascia at apical third.....	43
Without such fascia.....	<i>cockerelli</i> , p. 871
43. With oblique light band at basal third.....	<i>walsinghami</i> , p. 885
Without such band.....	<i>pennsylvanica</i> , p. 885
44. With white or whitish markings at apical third.....	45
Without white markings at apical third.....	60
45. With longitudinal deep black line on fold.....	<i>trilineella</i> , p. 873
Without such line.....	46
46. With complete fascia at apical third.....	47
Fascia more or less interrupted or absent.....	57
47. With head unmottled ochreous.....	<i>monumentella</i> , p. 888
Head more or less mottled.....	48
48. Forewings with vein 3 and 4 stalked.....	<i>conclusella</i> , p. 887
Forewings with veins 3 and 4 separate.....	49
49. Forewings with longitudinal black line before apex.....	<i>sequax</i> , p. 884
Without such line.....	50
50. With large black discal spot reaching up to costal edge.....	<i>occidentella</i> , p. 884
Without such spot.....	51
51. Fascia strongly outwardly angulated.....	52
Fascia nearly straight.....	55
52. Face white.....	53
Face not white.....	54
53. Tuft on second joint of labial palpi large, much longer at base than at apex,	<i>versutella</i> , p. 878
Tuft on second joint short and even in its entire length.....	<i>lynceella</i> , p. 879
54. Central part of underside of abdomen pure ochreous white.....	<i>nigrimaculella</i> , p. 880
Underside of abdomen dark mottled.....	<i>luminimaculella</i> , p. 881
55. With dark costal spot at basal third.....	<i>bicostomaculella</i> , p. 879
Without such spot.....	56
56. Terminal joint of labial palpi with white annulation before tip.....	<i>tephriacella</i> , p. 886
Terminal joint of labial palpi without annulation.....	<i>dyariella</i> , p. 877
57. Basal half of costa whitish.....	<i>pseudocacaciella</i> , p. 881
Basal half of costa not whitish.....	58
58. First abdominal segments velvety ochreous above.....	<i>scrofinella</i> , p. 882
First abdominal segments not velvety ochreous above.....	59
59. Forewings with raised scales.....	<i>maculimarginella</i> , p. 881
Forewings without raised scales.....	<i>vernella</i> , p. 884
60. With base of costa black.....	<i>lindenella</i> , p. 876
Base of costa not black.....	61
61. With horny frontal prominence.....	<i>harucusiella</i> , p. 875
Without such.....	<i>pravinominella</i> , p. 875

A. — Recognized Species.

GELECHIA CERCERISELLA Chambers.

Depressaria cercerisella CHAMBERS, Can. Ent., IV, 1872, pp. 108, 129, 147, 148.
Gelechia cercerisella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, pp. 110, 142. —
WALSINGHAM, Trans. Am. Ent. Soc. Phila., 1882, p. 177. RILEY, Smith's

List Lep. Bor. Am., No. 5334.—Busck, Dyar's List Amer. Lep., No. 5714, 1903.

Gelechia olympiadella Zeller, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 259, pl. III, fig. 15.—CHAMBERS, Can. Ent., IX, 1877, p. 24; Bull. U. S. Geol. Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5433.

Not *Gelechia cercerisella* CHAMBERS, Can. Ent., VI, 1874, pp. 230-231; Can. Ent., IX, 1877, p. 23.—WALSINGHAM, Trans. Am. Ent. Soc. Phila., 1882, p. 179.

Chambers found what he supposed to be a variety of the species in Texas with an additional white spot on the fold and consequently made *Gelechia quinella* Zeller, which is this supposed variety a synonym of the present species. This "variety" is truly *quinella* Zeller, but is a quite distinct species, while Zeller's *olympiadella*, as the description, figure, and types in Cambridge Museum show, is the same as Chambers' *Cercis* feeding species. Zeller points out well the differences between the two species.

The present species is one of the commonest *Gelechiids* in the vicinity of Washington, and its pretty larva, well described by Chambers, can be found all summer spinning up the leaves of redbud. There are at least two generations in this locality. The imagoes of one brood issue about September 1, and the following brood overwinters as pupa and comes forth as imago in early May.

In U. S. National Museum are authentic specimens, received and labeled by Chambers, besides large bred series from District of Columbia, and captured specimens from Kansas and Texas.

GELECHIA QUINELLA Zeller.

Gelechia quinella Zeller, Verh. k. k. zool.-bot. Gesell. Wien., XXIII, 1873, p. 260, pl. III, fig. 14.—CHAMBERS, Can. Ent., IX, 1877, p. 23.—Busck, Dyar's List Amer. Lep., No. 5715, 1903.

Gelechia cercerisella var. CHAMBERS, Can. Ent., VI, 1874, p. 231; IX, 1877, p. 23.—WALSINGHAM, Trans. Am. Ent. Soc. Phila., 1882, p. 177.

This species must, according to the explanation given under the previous species, stand as a good species, distinct from *cercerisella*—Chambers=*olympiadella* Zeller.

I have examined, besides Zeller's types in the Cambridge Museum, the specimens there, originally belonging to Salem Academy of Natural History, which Lord Walsingham had before him in 1882 with his blue labels, nos. 976 and 989.

Authentic specimens of Chambers' supposed variety of *cercerisella* are found in Cambridge Museum and in U. S. National Museum, where are also several other specimens, all like the type and Chambers' specimens from Texas.

GELECHIA ARIZONELLA, new species.

* *Gelechia arizonella* Busck, Dyar's List Amer. Lep., No. 5716, 1903.

Antennae black; labial palpi with dense slightly furrowed brush, black; the inside of the second joint and the middle of the terminal

joint with sparse whitish scales intermixed. Face, head, and thorax whitish, but heavily overlaid with dark fuscous scales; top of head and middle of thorax lighter than face and shoulders. Forewings deep bronzy black with four white markings, namely, one large outwardly oblique white costal streak near base, the lower tip of which crosses the fold; one nearly elliptical white spot on the middle of the wing; one triangular white costal spot at the beginning of the cilia, and opposite this a smaller dorsal white spot.

The spots are identical with those found in the two preceding species, *cercerisella* and *quinella*, except that the second costal spot in the former and the two middle spots of the latter have been replaced by the single central spot in *arizonella*.

Hindwings as broad as forewings; light silvery fuscous, darker along costa and toward the tip. Cilia a shade lighter. Abdomen light fuscous with a metallic purple sheen; each joint is fringed posteriorly with whitish scales, and the two first joints are velvety yellowish above.

Legs dark fuscous; tarsal joints narrowly tipped with whitish.

Alar expanse.—13 to 15 mm.

Habitat.—Arizona.

Type.—No. 6373, U.S.N.M.

Collected by Mr. E. A. Schwarz in Santa Rita Mountains, Arizona, in May.

Very near the foregoing species and the following, but at once distinguished by its dark head, its different wing spots, and its unbarred legs.

GELECHIA COLORADENSIS, new species.

Gelechia coloradensis BUSCK, Dyar's List Amer. Lep., No. 5717, 1903.

Antennæ black; labial palpi with well-developed brush; second joint white, slightly sprinkled with dark scales above, terminal joint black with white tip. Face white; head and thorax uniform dark purplish black. Forewings deep purplish black with five pure white markings, namely, an outwardly oblique costal white streak near base, reaching the fold; an elliptical white spot on the middle of the wing; an angulate white costal spot at the beginning of the cilia; an opposite small dorsal white spot and a small white dot on the fold, below and forward of the central spot. Just before apex are found a few single white scales.

The ornamentation of the wing is precisely similar to that of the preceding species, *arizonella* Busck, with the addition of the last mentioned small white dot on the fold. Hindwings as broad as forewings, dark fuscous.

Abdomen above purplish black, below whitish. Legs dark fuscous with broad white bars on tibia and tarsi and with posterior coxæ white.

Alar expanse.—15 to 16 mm.

Habitat.—Colorado, Florida, South Carolina.

Type.—No. 6374, U.S.N.M.

This species is very close to the foregoing three species, especially to *arizonella* Busck, but at once distinguished from this by its pure white face and black head, by its light palpi and white barred legs, as well as by the slight difference in wing ornamentation.

The name of the species is a misnomer because while the types of the species came from Colorado I have subsequently identified it from Florida and South Carolina.

GELECHIA TRIALBAMACULELLA Chambers.

Galechia trialbamaculella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 250; Bull. U. S. Geol. Surv., III, 1878, p. 147—RILEY, Smith's List Lep. Bor. Am., No. 5497, 1891—BUSCK, Dyar's List Amer. Lep., No. 5718, 1903.

Gelechia epigrella CHAMBERS, Journ. Cinn. Soc. Nat. Hist., III, 1881, p. 289.—RILEY, Smith's List Lep. Bor. Am., No. 5359, 1891.

Types of both species with Chambers' labels on the pins are found in the Museum of Comparative Zoology in Cambridge, and prove, as the descriptions would indicate, that it is only one species twice described.

A large bred series, showing considerable variation in the white markings, is found in U. S. National Museum, determined by Lord Walsingham as *epigrella*.

Food plant—*Vaccinium stamineum*.—The following are the notes on this series in the U. S. Department of Agriculture, given under No. 2788:

An apparently very numerous larva of a skeletonizer on *Vaccinium stamineum* was found in Virginia (presumably by Mr. Theo. Pergande and near Washington City) on July 16. The larva fastens together two or more leaves and feeds between them on the epidermis, forming from its frass a tube, which is open at both ends. The larva is about 8 mm. long, pale dirty yellowish or greenish yellow, with six darker yellow stripes, head and cervical shield dark yellow; moths issued from July 26 to August 17.

Chambers' type was bred from the nearly related *Epigæa repens*.

In U. S. National Museum is another series of apparently this same species bred from sweet fern, *Comptonia asplenifolia*, and also identified by Lord Walsingham as *epigrella* Chambers. This would be an unusually diverse food plant for a Gelechiid, and I was suspicious that the latter series would prove another species, as it eventually may. But the rather ample material can not be separated at present except by the labels, and the notes on the larvæ are so similar that for the time being at least I must assume all to be one species.

Should it ultimately prove to be two species by more accurate observations on the larvæ, the species on *Comptonia* might properly be

given Chambers' first name, *trialbamaculella*, and his second name be retained for the feeder on *Vaccinium* and *Epigaea*.

GELECHIA CONFUSELLA Chambers.

Gelechia confusella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 251; Bull. U. S. Geol. Surv., IV, 1878, p. 142.—RILEY, Smith's List Lep. Bor. Am., No. 5342, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5719, 1903.

Depressaria persicella MURTFELDT, Rep. Mich. St. Agr. Coll., 1899.

Gelechia persicella MURTFELDT, Can. Ent., XXXII, 1900, p. 164.

Food plant.—*Prunus persica*.

Habitat.—Michigan.

Cotypes of Miss Murtfeldt's species are in U. S. National Museum under type No. 4697.

The species is very close to the foregoing and I have no doubt is the same as Chambers' *Gelechia confusella*, the type of which is lost, but the description of which tallies in every detail with the peach feeder.

GELECHIA BIMACULELLA Chambers.

Depressaria bimaculella CHAMBERS, Can. Ent., IV, 1872, pp. 108, 129, 147, 148.

Gelechia bimaculella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5326, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5720, 1903.

Gelechia (?*Lita*) *ternariella* ZELLER, Verh. k. k. zool.-bot. Gesell. Wien., XXIII, 1873, p. 264, pl. III, fig. 19.

Gelechia ternariella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 147.—RILEY, Smith's List Lep. Bor. Am., No. 5491, 1891.

Gelechia sylvacolella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, pp. 86, 147.—RILEY, Smith's List Lep. Bor. Am., No. 5489, 1891.

Type No. 440 in the U. S. National Museum of *Depressaria bimaculella*, labeled in Chambers' handwriting and dated 1872, agrees with his type specimen in the Museum of Comparative Zoology in Cambridge and shows that it is identical with Zeller's *ternariella*, type of which, in excellent condition, is also found in the Cambridge Museum. The type in U. S. National Museum bears besides Chambers' name label also another folded label in his handwriting: "Congeneric with *cercorisella* and perhaps a true *Gelechia*." It also bears Lord Walsingham's blue label no. 1168.

The type of *Gelechia sylvacolella* Chambers is lost, but the description agrees well with the present somewhat variable species, and it seems proper to regard it as a variety of it, as suggested by Chambers.

Habitat.—Kentucky, Texas.

GELECHIA CONTINUELLA Zeller.

Gelechia continuella ZELLER, Isis, 1839, p. 198.—STAUDINGER and REBEL, Cat. Lep. Eur., II, No. 2597, 1901.—MOESCHLER, Wiener ent. Monatschr., 1864, p. 200.—GROTE, Can. Ent., IV, 1872, p. 126.—RILEY, Smith's List Lep. Bor. Am., No. 5343, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5721, 1903.

Gelechia trimaculella PACKARD, Proc. Bost. Soc. Nat. Hist., XI, 1867, p. 61.

Gelechia albomaculella CHAMBERS, Can. Ent., VII, 1875, p. 209; Bull. U. S. Geol. Surv., IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5306, 1891.

Moeschler originally recorded *continuella* from Labrador. In the Museum of Comparative Zoology in Cambridge are Packard's two types of *trimaculella*, also described from Labrador.

So far as the specimens, which are in poor condition, permit comparison, they agree in every respect with authentic European specimens of *continuella* Zeller in U. S. National Museum. From the Beinger collection in Laval University, Quebec, I have obtained the unique type of Chambers' *Gelechia albamaculella*. It is in poor condition, without palpi and wings on one side, but recognizable, and undoubtedly authentic, with Chambers' label on the pin. It is same species as *trimaculella* Packard.

The types of the latter in Cambridge bear Lord Walsingham's blue labels no. 838-839, corresponding to his identification in his notebook,¹ *trimaculella* Packard.

The American specimens agree with the European in having veins 3 and 4 and 6 and 7 on hindwing shortstaked.

GELECHIA RIBESSELLA Chambers.

Gelechia ribesella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 290; Bull. U. S. Geol. Surv., III, 1877, p. 128; Bull. U. S. Geol. Surv., IV, 1878, p. 146.—RILEY, Smith's List Lep. Bor. Am., No. 5467, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5722, 1903.

The unique type of this species is in the Museum of Comparative Zoology in Cambridge in good condition. It is a fine, well-described, and easily recognized species.

Chambers bred it from currant in Colorado at an altitude of 8,500 feet.

In the U. S. National Museum is a fine series, bred last summer from currant in Colorado by Dr. Harrison G. Dyar.

GELECHIA TROPHELLA, new species.

Gelechia trophella Busck, Dyar's List Amer. Lep., No. 5723, 1903.

Antennae light silvery fuscous, with narrow black annulations. Second joint of labial palpi with well-developed brush, longer at base than at apex; silvery white liberally mottled with black; underside of brush black; terminal joint black, slightly sprinkled with white scales. Lower part of face and tongue ochereous; upper part of face, head, and thorax light fuscous, intermixed with white and black metallic scales. Basal half of forewings dark iridescent fuscous, liberally intermixed with white and black scales. At basal third is an oblique outwardly directed black costal streak, somewhat wider at its lower end on the cell. Outer half of forewings shining black, with sparse white scales around the edges. At apical third is a transverse, per-

¹ See preface, p. 768.

pendicular, slightly outwardly angulated white fascia across the wing. Cilia purplish white, with sparse black scales intermixed.

Hindwings as broad as forewings, light shining fuscous; cilia lighter yellowish fuscous. Abdomen light iridescent purplish fuscous. Legs bluish black, mottled with white scales; tarsi dark purple, with each joint tipped with white.

Alar expanse.—15 to 16 mm.

Food plant.—Oak.

Habitat.—Colorado.

Type.—No. 6375, U.S.N.M.

This species comes nearest *continella* Zeller, but has the fascia well defined and is easily distinguished from that species by its dark head and long brush on the labial palpi.

The types were bred by Dr. Harrison G. Dyar, who has given me the following notes on the larva:

Larva.—Head and cervical shield black; body pale, thickly mottled with red brown, obscurely longitudinally lined and leaving pale spaces about the minute black tubercles. Dorsal line geminate, irregular; sublorsal broader, blotched below tubercle i; lateral and two subventral lines obscure. Thoracic feet black; anal plate brown bordered.

On oak in the Platte Canyon, Colorado. Imago June 18.

GELECHIA LUGUBRELLA Fabricius.

Gelechia lugubrella FABRICIUS, Ent. Syst., III, 1794, 2, 299, 54.—STAUDINGER and REBEL, Cat. Lep. Eur., II, No. 2617, 1901.—BUSCK, Dyar's List Amer. Lep., No. 5724, 1903.

In Professor Fernald's collection are two specimens from Orono, Maine, determined by Lord Walsingham as *Gelechia lugubrella* Fabricius. They bear his blue labels no. 99 and 213 and undoubtedly belong to this European species, which must thus be included in the American list.

In the U. S. National Museum is a good series of European specimens.

The species is very distinct from its nearest allies and easily recognized by its two white wing markings, the oblique white streak at basal third and the narrow inwardly curved white fascia at apical third.

GELECHIA ALBILORELLA Zeller.

Gelechia albimorella ZELLER, Verh. k. k., zool.-bot. Gesell. Wien, XXIII, 1873, p. 261, pl. iii, fig. 16.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5303, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5725, 1903.

Gelechia trifasciella CHAMBERS, Cinn. Quart. Journ., II, 1875, p. 252; Can. Ent., IX, 1877, p. 24; Bull. U. S. Geol. Surv., IV, 1878, p. 147.—RILEY, Smith's List Lep. Bor. Am., No. 5498, 1891.

Type No. 464, in the U. S. National Museum, of *trifasciella*, with Chambers' label on the pin, is identical with two types in Cambridge

Museum; also with Chambers' labels. One of these bears Lord Walsingham's blue label No. 1004, corresponding to his identification in his notebook,¹ *trifasciella* Chambers.

These types agree exactly with Zeller's description and figure of *albilorella*, a specimen of which, identified by Lord Walsingham, is in U. S. National Museum.

This striking species is common in collections from Arizona, Colorado, and Texas.

GELECHIA DENTELLA, new species.

Gelechia dentella Busck, Dyar's List Amer. Lep., No. 5726, 1903.

Antennæ dark fuscous, with lighter faint annulations. Labial palpi with well-developed brush; second joint yellowish white; terminal joint white, with a fuscous annulation before the tip.

Face, head, and thorax yellowish white; shoulders black. Forewings black and yellowish white, as follows: Costal half from base to apical, two-fifths black, and entire apical two-fifths black except two small opposite costal and dorsal spots, which are yellowish white. Dorsal half of wing from base to apical, two-fifths yellowish white. The white part projects upward at apical two-fifths to the costal edge and has another slight projection into the costal black part at basal third of the wing. Cilia black.

Hindwings broader than forewings, light yellowish gray; abdomen light yellowish fuscous; legs yellowish white, barred with black.

Alar expanse.—9 to 10 mm.

Habitat.—Phoenix, Arizona.

Type.—No. 6376, U.S.N.M.

Cotypes in collection of Mr. William D. Kearfott, to whom I am indebted for this and the two following similar species.

Close to the following two species, *sistrella* and *abdominella*, but distinguished from them by the absence of any white on basal three-fifths of costal half of forewing.

GELECHIA SISTRELLA, new species.

Gelechia sistrella Busck, Dyar's List Amer. Lep., No. 5727, 1903.

Antennæ black, with narrow, indistinct white annulations; labial palpi with well-developed brush; second joint white; terminal joint white, sprinkled with black, and with tip black; face, head, and thorax white; shoulders black; forewing, deep black and pure silvery white, as follows: A broad longitudinal black in the middle of the wing, equidistant from the costal and dorsal edge, starting at base of costa and reaching one-half of the length of the wing, where it turns

¹See preface, page 768.

sharply rectangularly upward, reaching costal edge and thus inclosing a narrow, longitudinal costal white patch; apical two-fifths black, with two large rounded opposite costal and dorsal spots, white. The rest of the wing—that is, the basal half of the dorsal edge and a perpendicular, nearly straight fascia just outside the middle of the wing—is white. Cilia black, tipped with whitish; hindwings broader than forewings, silvery fuscous; abdomen dark fuscous and tuft yellowish; legs white, with black bars on the outside.

Alar expanse.—9 to 10 mm.

Habitat.—Phoenix, Arizona.

Type.—No. 6377, U.S.N.M.

Cotypes in collection of Mr. William D. Kearfott. Very similar to the preceding species, but at once distinguished by the white basal costal patch.

GELECHIA ABDOMINELLA, new species.

Gelechia abdominella Busck, Dyar's List Amer. Lep., No. 5728, 1903.

Antennæ black, with sharp white annulations. Labial palpi with second joint white; brush well developed; terminal joint white, with slight fuscous shading in front; tip white.

Face, head, and thorax white, with a faint ochereous tint; shoulders black.

Forewings black and white, as follows: Extreme base of costa black; a large triangular costal spot before the middle of the wing, with tip reaching beyond the fold, black, with a central dot on the costa, white. Apical two-fifths of wing black, with a costal and dorsal triangular white spot at the beginning of the cilia nearly or quite reaching each other with their thinly extended tips. Rest of forewing—that is, the dorsal three-fifths, with two upward projections reaching the costal edge on each side of the costal black triangular spot—white, with a faint ochereous tint. Cilia blackish.

Hindwings broader than forewings, light silvery gray. Abdomen and hindlegs light silvery salmon red; forelegs white, barred with black.

Alar expanse.—9 to 10 mm.

Habitat.—Phoenix, Arizona.

Type.—No. 6378, U.S.N.M.

Cotypes in collection of Mr. William D. Kearfott.

Very similar in size and general habitus to the two foregoing species; so similar that by superficial examination they might all be taken to represent one species, which, however, the constancy in their differences clearly shows that they are not. The present species is easily recognized by its peculiarly colored abdomen, as well as by the isolated triangular costal black spot.

GELECHIA BASQUELLA Chambers.

Oecophora basquella CHAMBERS, Can. Ent., VII, p. 92.

Gelechia basquella CHAMBERS, Can. Ent., VII, 1875, p. 124.—BUSCK, Dyar's List Amer. Lep., No. 5729, 1903.

Gelechia (?) *basquella* CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, pp. 87, 142.

Gelechia (*Bryothropa*?) *basquella* WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 178.

Gelechia basquella RILEY, Smith's List Lep. Bor. Am., No. 5329, 1891.—WALSINGHAM, Proc. Zool. Soc. Lond., 1897, p. 75.

Gelechia costipunctella MÖSCHLER, Abhand. d. Senckenb. naturf. Ges., XVI, 1889, p. 334.—WALSINGHAM, Proc. Zool. Soc. Lond., 1892, p. 519.

Chambers' type is in the Museum of Comparative Zoology, Cambridge, and is identical with specimens in Professor Fernald's collection and in Dr. William Dietz's collection, named by Lord Walsingham, who recorded this species from the West Indies and found the synonymy with Möschler's *costipunctella*.

I have collected this species at light in the District of Columbia and found its foodplant and larva there; I have also taken specimens in Kentucky, Key West, Florida, Porto Rico, and St. Thomas, West Indies. In the National Museum are, besides these specimens, others from Kansas, Iowa, and Texas.

The species has veins 3 and 4 in the forewings stalked, but agree otherwise with the definition of the present genus, and seems close to the three foregoing species. Veins 6 and 7 in hindwings are stalked.

Foodplant.—*Cassia chamaecrista*.

The larva is when full-grown about 10 mm. long, with head and thoracic shield and feet shining black and with the three thoracic segments, except anterior part of the third joint, deep purplish red; the rest of the body is green, with very small, deep black tubercles emitting short dark hairs.

Dr. Dyar has kindly drawn up the following technical description:

LARVA.—Head rounded, full, oblique and retracted; mouth projecting; the labium and spinneret prominent; clypeus high, triangular, antennæ small; shining black, labium, and epistoma pale; width, .6 mm. Body cylindrical, normal; joints 2 to 3 and 12 to 13 tapering; thoracic feet distinct, the joints black ringed; abdominal feet slender, rather small, normal, the crochets in a complete ring about the small, circular planta; cervical shield large, transverse, rounded on the posterior corners, shining black, cut by a fine, faint, pale dorsal line; joints 2 and 3 entirely dark vinous except the neck in front of the cervical shield; joint 4 in the incisure in front and in a broad band on the posterior third of the same dark vinous, extending even on the venter. The white area thus formed on the anterior part of joint 4 on the otherwise uniformly red thorax appears irregularly edged and lumpy. Rest of body whitish, immaculate, greenish from the blood. Tubercles small, round, black but distinct, bearing short, stiff, dark setæ. On the thorax tubercles ia and ib are separate, iia and iib, iv and v united in pairs. On joint 3 the tubercle plates are large of ib, iia + iib and iv + v, but on joint 3 they are small, and the paired tubercles stand separate though contiguous; on the prothorax the prespiracular and subventral tubercles are large. On the abdomen tubercle i is dorsal and cephalad to ii, iii is near to the spiracle, above it, iv and

v contiguous, in line, vi subventral posteriorly, vii of three contiguous tubercles on the anterior side of the leg base, viii on the inner side of the leg base. Spiracles small, black ringed; anal shield pale brown, distinct; anal feet with brownish outer shields.

GELECHIA PAULELLA, new species.

Gelechia paulella Busck, Dyar's List Amer. Lep., No. 5730, 1903.

Antennæ dark brown with indistinct yellowish annulations. Labial palpi yellowish white with base of second joint and extreme tip of terminal joint brown. Brush well developed undivided face; head and thorax yellowish white, shoulders dark brown. Forewings shining dark blackish brown with white markings. Entire dorsal edge white, this color reaching up the fold except right at base and slightly crossing the fold with an oblate upward projection at apical third of the wing. Beginning at basal one-fourth of costa and reaching the costal white part is a sharply defined outwardly directed white fascia. At apical fourth of the wing and nearly perpendicular on the costal edge is another narrower white fascia, somewhat dilated on the costal edge.

Between these two fasciae, at the middle of the wing, is a large nearly semicircular white costal spot.

Cilia white, sparsely sprinkled with dark brown scales.

The white markings show indistinctly through on the underside of the wings.

Hindwing broader than forewings, silvery pale gray, nearly white; cilia yellowish.

Abdomen light yellowish fuscous. Legs yellowish; tarsi sprinkled with fuscous.

Alar expanse.—13 to 23 mm.

Habitat.—Arizona, Colorado.

Type.—No. 6379, U.S.N.M.

This distinct and fine species is described from numerous specimens collected in Arizona and Colorado and received from several sources (Schwarz, Dyar, Gillette, Barnes).

The specimens vary very much in size, the largest being by far the commonest, but the ornamentation is constant, and I have no hesitation in including the small specimens as the same species.

The species comes nearest the following and *Gelechia packardella* Chambers, but clearly has a quite different ornamentation.

GELECHIA UNIFASCIELLA, new species.

Gelechia unifasciella Busck, Dyar's List Amer. Lep., No. 5731, 1903.

Antennæ deep black. Labial palpi with second joint pure white except the base, which is black on the outside; brush well developed, longer at base than at apex, not furrowed; terminal joint black, sprinkled on the outside toward the base with white scales.

Face, head, and thorax pure silvery white, patagia black. Forewings deep bronzy black, with dorsal edge below the fold, from base to cilia white, and with a white narrow inwardly curved fascia at apical fourth.

The black part of the wing is found, under a lens, to be slightly sprinkled with minute bluish white atoms.

Cilia white sprinkled with black scales. Hindwings broader than forewings, shining light fuscous, cilia with a yellowish tint.

Abdomen light silvery and purplish fuscous, with the two first joints yellowish above, below sprinkled with white.

Legs purplish black, sprinkled with white scales and with each joint slightly tipped with white.

Alar expanse.—18 mm.

Habitat.—Arizona.

Type.—No. 6380, U.S.N.M.

A striking and distinct species near the foregoing, collected at Williams, Arizona, in July, by Mr. H. S. Barber.

GELECHIA PACKARDELLA Chambers.

Gelechia packardella CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 143; IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5437, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5732, 1903.

I have not yet definitely determined this species, the type of which is lost, but it evidently belongs in this immediate group and will, when found, easily be identified from the description.

Habitat.—Colorado.

GELECHIA ARISTELLA, new species.

Gelechia aristella BUSCK, Dyar's List Amer. Lep., No. 5733, 1903.

Antennæ dark, shining brown. Labial palpi with well-developed spreading furrowed brush, second joint light canary yellow, terminal joint whitish, sprinkled with sparse light fuscous scales. Face, head, and thorax light, clear canary yellow; patagia black.

Forewings deep purplish black with two conspicuous broad longitudinal canary-yellow streaks; one from base along and immediately below the costal edge to apical third; the other, which is broader, from base along and including the entire dorsal edge nearly to apex. Cilia dark purplish fuscous.

Hindwings much broader than forewings, light silvery fuscous, cilia still a shade lighter.

Abdomen light purplish gray; anterior joints above velvety yellowish.

Legs purple, sprinkled with white scales.

Alar expanse.—22 mm.

Habitat.—Arizona.

Type.—No. 6381, U.S.N.M.

Collected in July at Williams, Arizona, by Mr. H. S. Barber.

This beautiful large species, which can not well be mistaken for any described American species, may be at once distinguished by the yellow coloring and the longitudinal ornamentation.

GELECHIA THORACEALBELLA Chambers.

Gelechia thoracealbella CHAMBERS, Can. Ent., VI, 1874, p. 235; Cinn. Quart. Journ. Sci., II, 1875, p. 252; Bull. U. S. Geol. Surv., IV, 1878, p. 147.—RILEY, Smith's List Lep. Bor. Am., No. 5492, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5734, 1903.

Types of this species were examined in the Museum of Comparative Zoology in Cambridge and found to be identical with specimen in U. S. National Museum bearing Chambers' label, *Gelechia thoracealbella*.

Both are in poor condition, but recognizable from the description, and unlike any other species known to me.

Habitat.—Texas.

GELECHIA MINIMACULELLA Chambers.

Gelechia minimaculella CHAMBERS, Can. Ent., VI, 1874, p. 235.—BUSCK, Dyar's List Amer. Lep., No. 5735, 1903.

Gelechia minimaculella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5410, 1891.

This species, of which the unique type is found in Cambridge, is very similar to the foregoing, *thoracealbella* Chambers, but distinguished by the small ochreous discal dots.

The type is in comparatively good condition, except lacking the palpi; but it is unspread, and consequently the venation has not been examined. I am, however, quite assured from its general appearance that it is a true *Gelechia*. It is a large blackish-brown species with light ochreous head, thorax, and (according to Chambers) labial palpi. The very faint small ochreous markings on the forewings are well described by Chambers.

Habitat.—Texas.

GELECHIA OCHREOSUFFUSELLA Chambers.

Gelechia ochreosuffusella CHAMBERS, Can. Ent., VI, 1874, p. 236; Cinn. Quart. Journ. Sci., II, 1875, p. 255; Bull. U. S. Geol. Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5430, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5736, 1903.

Gelechia depressostrigella CHAMBERS, Can. Ent., VI, 1874, p. 236; Bull. U. S. Geol. Surv., III, 1878, p. 142.—RILEY, Smith's List Lep. Bor. Am., No. 5350, 1891.

Gelechia depressostrigella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 255.

Type no. 450 in the U. S. National Museum of *depressostrigella* is like the type in Professor Fernald's collection of that species and

the same as eight types in the Museum of Comparative Zoology in Cambridge labeled by Chambers *depressostrigella*.

All of these types agree with the description and are undoubtedly authentic.

So far as known to me no authentic specimen labeled *ochreosuffusella* is in existence, and the above synonymy is established merely on Chambers' evidence.

The two species are described from Texas, one right above the other,¹ and there, Chambers thinks, they are two different species, though he says that they resemble each other. He writes that the color of head and palpi are different in the two species, but does not give the color of one of them (*depressostrigella*), and the color given for the other suits his own authentic specimens of the first.

Later² he corrects his description somewhat and says that they may be one and the same species.

As the many types of *depressostrigella* show some little variation, it seems under the circumstances admissible to place the two names as synonyms, thus lessening the previous long list of unknown species.

Should future collecting reveal two closely similar species, which with sufficient probability can be referred to the two species, then, of course, the second name should be resurrected and retained for the species represented by the types.

In the U. S. National Museum, besides the type, there is one specimen labeled by Lord Walsingham, *Gelechia depressostrigella*. This, as all the types, came from Texas.

GELECHIA STRIATELLA, new species

Gelechia striatella Busck, Dyar's List Amer. Lep., No. 5737, 1903.

Antennæ shining dark brown, slightly serrate toward the tip. Labial palpi with well-developed furrowed brush, ocherous white, thickly sprinkled with black and gray scales, underside of brush nearly black.

Face whitish; head and thorax clothed with light bluish gray scales, each scale slightly tipped with black or gray, which produces to the naked eye a uniform dark-gray color.

Forewings with ground color light whitish gray, thickly sprinkled with darker gray, brown, and black scales, which are arranged in indistinct narrow longitudinal darker lines, somewhat more pronounced in the apical part of the wing, but even there not clearly perceptible to the naked eye. Along the fold and at the dorsal cilia the wing is faintly suffused with ocherous. Cilia whitish, sprinkled with black dots.

¹ Can. Ent., VI, p. 236.

² Cinn. Quart. Journ. Sci., II, p. 255.

Hindwings a little broader than forewings, shining light ochereous fuscous; cilia golden gray.

Abdomen metallic yellowish fuscous, underside darker, sprinkled with black scales.

Forelegs on the outside black, on the inside whitish; tarsi black, each joint tipped with ochereous. The other legs are light gray, sprinkled with black scales; tuft on posterior tibial yellowish.

Alar expanse.—16 to 17.5 mm.

Habitat.—Arizona.

Type.—No. 6382, U.S.N.M.

This species is very near the foregoing, and I have tried hard to convince myself that it might be *ochreosuffusella* (distinct from *depressostrigella*), but I can not make the description apply.

The light whitish ground color and the fainter striation distinguish it from Chambers' ochereous brown species.

Described from more than forty specimens in good condition, all from Arizona, and mostly collected by Mr. E. A. Schwarz in Santa Rita Mountains in May.

This large series shows hardly any variation.

GELECHIA OCHREOSTRIGELLA Chambers.

Gelechia ochreostrigella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 247; Can. Ent., X, 1878, p. 54; Bull. U. S. Geol. Surv., IV, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5431, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5738, 1903.

Not *Gelechia ochreostrigella* CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 126.

Chambers described two different insects under the name *Gelechia ochreostrigella*, types of both of which I have examined in the Museum of Comparative Zoology in Cambridge.

The last described is a *Gnorimoschemat*, and will be found treated under that genus (p. 831).

The other (the present) species is a typical *Gelechia* quite similar to *ochreosuffusella*, but easily distinguished by its ochereous head and thorax and the dark, nearly black, basal costal part of the wing.

In the U. S. National Museum is a specimen from California, which was also the locality of the type.

GELECHIA HIBISCELLA, new species.

Gelechia hibiscella BUSCK, Dyar's List Amer. Lep., No. 5739, 1903.

Antennae dark brown, not annulated, slightly serrate toward the tip.

Labial palpi with well-developed spreading brush, yellowish white; second joint with a few black scales on the outside; terminal joint with tip and one annulation near base black.

Face, head, and thorax shining ochereous white; shoulders purplish black. Costal half of forewings dark brown, in some specimens nearly

black; dorsal half including apex light ochereous brown, in some specimens whitish. The limit between these two parts of the wing is not very definite and somewhat variable.

In the dark costal part are found lighter, yellowish brown, irregular patches, one large indistinct at the middle of the costa, one small rather more distinct costal spot at the beginning of the cilia and in some specimens others not well defined. In the dorsal light part of the wing are ill-defined darker shadings and the veins are indicated darker so as to produce a striate effect. On the fold at the basal one-third is a small nearly black spot which seems to be constant. Likewise is a row of black dots around the apical edge constant in all my specimens. The other markings are more or less varying.

Hindwings a little broader than forewings, light bluish fuscous; cilia yellowish. Abdomen yellow. Legs dark purple with yellowish white bars on the outside and with tarsal white annulations.

Alar expanse.—16 to 17 mm.

Habitat.—District of Columbia.

Food plant.—*Hibiscus moscheutos*.

Type.—No. 6383, U.S.N.M.

This species is quite near to the foregoing species, *ochreostrigella* Chambers, but not so conspicuously streaked and with light, dark annulated, third joint of labial palpi instead of the uniformly dark, nearly black, terminal joint in *ochreostrigella*.

I have reared this variable, but always easily recognized species repeatedly from the common swamp rose mallow.

The larva is rather large when full grown in proportion to the imago, being 22–23 mm. long and with greatest width 2.2 mm. It is cylindrical, only slightly tapering fore and back. Head rounded, shorter than wide, black with reddish brown vertex; width, 1.3 mm. First thoracic segment somewhat narrower than the following joint, reddish; thoracic shield black; width, 1.6 mm.; length, 0.7 mm.; straight in front and nearly straight posteriorly. Second thoracic segment dark reddish, with anterior part white above. Third thoracic segment and the rest of the body white; on the posterior half of this joint begin six wavy narrow interrupted longitudinal dark reddish dorsal lines, which run through on all the rest of the segments. These lines are darker in the young larvæ, which otherwise are like the full-grown larvæ. Tubercles shining deep black, bearing short black hairs; they are arranged conspicuously on the white part between the dark lines. Ventral part of the abdominal segments white. Thoracic feet black; abdominal prolegs normal, white, with a complete circle of brownish hooks.

The larva feeds on the leaves or in the capsules, generally in large numbers together; when ready to pupate they partially bite off one or

more leaves, which thus dry up and crumple and afford convenient shelter; or others find room in the dried fruit or between it and the large surrounding calyx. The species overwinters as larva, and two generations are found in this locality, the imagoes issuing from the hibernated larva in May and from the summer brood in August.

GELECHIA COCKERELLI, new species.

Gelechia cockerelli Busck, Dyar's List Amer. Lep., No. 5740, 1903.

Antenna dark brown with indistinct yellow annulations. Labial palpi are long and slender, brush on second joint only slightly developed; white with a few dark scales; terminal joint somewhat darker, yellowish. Face yellowish white. Head and thorax rust yellow, thorax with three longitudinal blackish lines.

Forewings light yellowish brown, with dark blackish brown markings; on dorsal edge near base is a large dark brown patch, therein differing from the foregoing similar *ochreostrigella* Chambers and *hibiscella* Busck, which both have dorsal base light, but costal base dark; in the present species the costal base is of the general color of the wing. At apical third is a blackish ill-defined costal spot, which runs out in a dark shade across the wing. Just before this spot is another smaller, more sharply defined costal blackish spot. Along the veins and in the disk are longitudinal dark lines, sharpest and darkest in the apical part of the wing, and each terminating at the base of the cilia in a deep black spot. These longitudinal streaks are interrupted at the end of the cell by a short thin perpendicular deep black streak, followed by a short light brown space. Cilia reddish yellow, slightly sprinkled with black.

Hindwings broader than forewings, yellowish fuscous; cilia yellowish.

Abdomen light brown. Legs light brown shaded with darker brown; tarsi blackish with each joint tipped with yellow.

Alar expanse.—15 to 16.5 mm.

Habitat.—New Mexico, Arizona.

Type.—No. 6384, U.S.N.M.

Collected at light in May in Mesilla Park, New Mexico, by Mr. T. D. A. Cockerell, after whom I take pleasure in naming this species. Also collected by Mr. E. A. Schwarz at Catalina Springs, Arizona, in April.

GELECHIA VARIABILIS, new species.

Gelechia variabilis Busck, Dyar's List Amer. Lep., No. 5741, 1903.

The insects which I shall describe under this name and as varieties of this species represent, in my opinion, undoubtedly only one species, but is the most variable Gelechiid with which I am acquainted (except

it be *Ypsolophus ligulellus* Hübner), and it will be necessary to describe at least some of the varieties separately.

It has seemed reasonable to me that one or more varieties of this evidently common Western species should have been described by Chambers as one or more species, and I have especially carefully compared this species with the descriptions of his several unrecognized species, but I am unable to find any which I could make apply and feel justified in adopting the name of.

The specimens which I regard as typical may be recognized from the following:

Antennæ brown, with indistinct lighter annulations. Labial palpi slender; second joint whitish, suffused with brown; the brush only slightly developed, but divided and with a longitudinal dark streak in the middle; terminal joint nearly uniform dark fuscous, the whitish ground color being entirely covered.

Face, head, and thorax light ochreous gray. Forewings light grayish yellow, slightly brownish toward the tip and with blackish brown longitudinal lines from base to apex, following the veins and becoming heavier and more blackish toward apex. Three short more pronounced heavy black longitudinal lines independent of the others are very conspicuous and are found, although modified in all the varieties; the first and shortest at base just within dorsal margin; the second on the fold, also starting more or less clearly from the base, but reaching its characteristic thickness and tone outside the first line and ending as a heavy line just before the middle of the wing, though after continued as one of the general thin lines to the dorsal apical edge. The third line is midway between the fold and the costal edge and begins at the middle of the wing and reaches to the end of the cell; also continued as one of the fainter lines from base to apex.

Cilia gray. Hindwings as broad as forewings, yellowish fuscous; cilia yellowish. Abdomen light yellowish brown. Legs yellowish without any markings.

Variety a.—The three prominent longitudinal black streaks are intact, but the other longitudinal lines are nearly or quite obsolete. The color of the forewings below the three black lines is dark chocolate brown, the color above the lines whitish purple, the two colors standing sharply against each other, separated by the black lines.

The color of head and thorax is correspondingly dark brown.

Variety b.—Ground color of forewings more whitish, thickly suffused with dark brown and gray single scales. The three heavy black longitudinal streaks are present, but with a tendency to break up in shorter streaks or totally disappear, especially the first and the third, which are represented as one, two, or three longitudinal dots.

The other longitudinal lines are obsolete, except right around apex, where they are indicated by a series of short indistinct streaks at base of the cilia.

Besides these two extreme varieties all intermediate forms occur between them and what I call the normal form. While single specimens of the extreme varieties might easily be taken for different species and while absolute proof to the opposite can not be obtained except through breeding, I have no doubt but that they all belong to one variable species.

Alar expanse.—19 to 20 mm.

Habitat.—California, Colorado.

Type.—No. 6385, U.S.N.M.

Described from some 20 specimens of all varieties in the U. S. National Museum; many others have been examined in the collections of Messrs. Dietz, Kearfott, and Gillette.

GELECHIA TRILINEELLA Chambers.

Gelechia trilineella CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 125; IV, 1878, p. 147.—RILEY, Smith's List Lep. Bor. Am., No. 5499, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5742, 1903.

In the Museum of Comparative Zoology in Cambridge I found six types of this species, authenticated by Chambers' labels and agreeing with his description. They are all, however, much faded. A fresh specimen in U. S. National Museum, which I have compared with the types, exhibits the detail of the description better. Similar good specimens I have examined in Dr. Dietz's collection, determined independently by him from the description.

Habitat.—Colorado, Arizona.

GELECHIA BIANULELLA Chambers.

Oeseis biannulella CHAMBERS, Cinn. Quart. Journ. Sci., 1875, p. 225; Bull. U. S. Geol. Surv., IV, p. 159; Journ. Cinn. Soc. Nat. Hist., II, 1880, p. 202, fig. 15.—RILEY, Smith's List Lep. Bor. Am., No. 5579, 1891.

Gelechia biannulella BUSCK, Dyar's List Amer. Lep., No. 5743, 1903.

Gelechia? ocellella CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 126.

Gelechia ocellella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5428, 1891.

I have examined type of *Gelechia ocellella* in Professor Fernald's collection and types of the same in Cambridge Museum; they are identical and agree with his description.

The synonymy with *Oeseis biannulella* I did not discover before I saw in Dr. Dietz's collection a specimen labeled by Lord Walsingham *Oeseis biannulella*. No authentic specimen from Chambers of this species exists, but I have no doubt that the specimen is rightly named by Lord Walsingham, as it faithfully agrees with Chambers' description, and if so it is the same as *Gelechia ocellella*. The description of the two species are nearly identical and could well both have been drawn from the same specimen.

GELECHIA DISCOOCELLELLA Chambers.

Gelechia discoocellella CHAMBERS, Can. Ent., IV, 1872, p. 194.—BUSCK, Dyar's List Amer. Lep., No. 5744, 1903.

Gelechia discoocellella CHAMBERS, Can. Ent., VI, 1874, p. 231.

Gelechia discoocella CHAMBERS, Cinn. Quart. Journ. Sci., 1875, II, p. 237; Bull. U. S. Geol. Surv., IV, 1878, p. 143.—RILEY, Smith's List Lep. Bor. Am., No. 5355, 1891.

Gelechia discoocella COQUILLET, Papilio, III, 1883, p. 98.

Gelechia discoocella DIETZ, Smith's List Ins. N. Jersey, 1900, p. 474.

Gelechia violaceofusca ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 258.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 148.—RILEY, Smith's List Lep. Bor. Am., No. 5510, 1891.

Zeller omitted to mention in his description of *violaceofusca* the ocellate spot at the end of the cell, which, though very indistinct in some lights, is plainly found in his unique well-preserved type in the Cambridge Museum. This type is a male and the spot is not nearly so prominent in this sex as in the females.

It is clearly the same species as represented by Chambers' four types of *discoocellella* also found in the Cambridge Museum and answering to his description of that species.

Chambers' name has precedence.

The ocellate spot at the end of the cell, as well as the lighter streak below the fold, are, as Chambers observed, somewhat variable, and especially in the males, indistinct; but the glossy violet sheen and the abruptly cut forewings makes this species easily recognized.

In the U. S. National Museum and in the collections of Professor Fernald and Dr. Dietz are specimens determined by Lord Walsingham as *Gelechia (Trichotaphe) discoocellella*. The species has, it is true, some general resemblance to the genus *Trichotaphe*, but palpi and venation place it in *Gelechia*.

Mr. Coquillet has given its food plant as *Polygonum*. This agrees with a note from Miss Murtfeld that she reared the types from *smart-weed*, *Polygonum hydropiperoides*, not, as Chambers wrote,¹ "small weed."

This species has a noteworthy color resemblance with another polygonum-feeding Tineid, *Aristotelia absconditella* Walker (p. 801).

It has a wide distribution; Chambers recorded it from Kentucky and Texas; Zeller from Texas; Coquillet from Illinois; in U. S. National Museum are specimens from Kansas (Crevecoeur), Illinois (Barnes), Pennsylvania (Dietz), District of Columbia (Busck).

GELECHIA ANARSIELLA Chambers.

Gelechia anarsiella CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 126.—RILEY, Smith's List Lep. Bor. Am., No. 5310, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5745, 1903.

¹ Cin. Quart. Journ. Sc., II, 1875, p. 237.

On the label of the type of this species in the Museum of Comparative Zoology in Cambridge is a note in Frey's handwriting:

After the palpi it is an *Ypsolophus*.—Frey.

It is true that the brush on second joint of labial palpi is strongly developed, but not in the long projecting pointed fashion found in *Ypsolophus*; it is a large divided spreading brush, just like that found in *Gelechia* (*Oeseis*) *bianulella* Chambers, and I do not consider it of generic value, but merely the extreme development of the brush as commonly found in *Gelechia*, with which genus *anarsiella* also agrees in venation and general habitus.

In U. S. National Museum is an identical specimen labeled by Chambers; there is also a fine specimen bred by Dr. Harrison G. Dyar from *Ceanothus* in Colorado.

According to Dr. Dyar, the larva hides in a silken tube in a folded leaf, or between leaves.¹

GELECHIA PRAVINOMINELLA Chambers.

Gelechia quadrimaculella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 290; Bull. U. S. Geol. Surv., III, 1877, p. 128.

Gelechia pravinominella CHAMBERS, Can. Ent., X, 1878, p. 50; Bull. U. S. Geol. Surv., IV, 1878, p. 146; RILEY, Smith's List Lep. Bor. Am., No. 5451, 1891; BUSCK, Dyar's List Amer. Lep., No. 5746, 1903.

Not *Gelechia quadrimaculella* CHAMBERS, Can. Ent., VI, 1874, p. 237 (see *Anacampsis rhoifrutella*, p. 845).

As this species, the type of which is lost, I have identified a specimen which agrees with Chambers' short description and which was taken in the same locality from where Chambers' type came.

It was bred by Dr. Dyar from cottonwood in Colorado.¹

GELECHIA BARNESIELLA, new species.

Gelechia barnesiella BUSCK, Dyar's List Amer. Lep., No. 5747, 1903.

Antennae simple dark fuscous. Labial palpi very long, slender; brush on second joint short and even; second joint whitish, sometimes with a rose tint, sprinkled with brown; terminal joint long, but shorter than the very long second joint, thin, pointed, whitish, sprinkled with black and dark brown. Head brown, loosely scaled, nearly tufted, and with a peculiar strong pointed horny frontal protuberance. Face somewhat lighter.

Forewings brown, of a somewhat variable shade in different specimens, from a reddish or deep purple brown to a lighter ashy or yellowish brown. At base of costa is a dark blackish spot, sometimes continued into an obscure oblique streak across the wing. On the middle of the disk is a short oblique blackish streak, and just below this another similar but fainter streak, together forming an arrow-

¹ Described by Dr. Dyar, Proc. U. S. Nat. Mus., XXV, 1902, p. 407.

head pointing toward the tip of the wing. At the end of the disk is a short perpendicular blackish streak edged with light scales. A little before apical third is a large, dark, ill-defined costal spot; on apposite on the dorsal edge is another similar spot. Around apical edge is a series of blackish spots, with the intervening spaces rather lighter than the general color of the wing.

Hindwings as broad as forewings, light silvery fuscous. Abdomen light yellowish brown. Legs whitish fuscous speckled with darker brown, each joint of tarsi tipped with white.

Alar expanse.—22 to 27 mm.

Habitat.—Colorado.

Type.—No. 6386, U.S.N.M.

Described from some thirty specimens collected by Dr. W. Barnes, in honor of whom the species is named, and by Messrs. Gillette and Schwarz.

The ornamentation is sometimes not very distinct, and the ground color shows some variation in shade, but the species is quite different from any described and easily recognized by its size, the very long evenly brushed palpi, and especially by the peculiar frontal horn, which is found both in the males and females. It is found also in a less marked degree in *Gelechia variabilis* Busek (p. 871).

GELECHIA LINDENELLA, new species.

Gelechia lindenella Busek, Dyar's List Amer. Lep., No. 5748, 1903.

Antennae light yellow, black at base and indistinctly annulated with dark fuscous. Labial palpi with brush short and even; terminal joint as long as second; ocherous white, sprinkled with black scales; tip of terminal joint black. Face white; head and thorax light ocherous. Forewings light ocherous, sprinkled with darker ocherous and black scales, especially along dorsal edge and toward apex, where the dark scales are arranged in indistinct longitudinal streaks between the veins. There are three black or very dark brown equidistant costal spots, one near the base, one at apical third, and one between these two. The one nearest base is the smallest, the next somewhat larger, and the outermost the largest. Just below this last is, at the end of the disk, an inconspicuous short and thin perpendicular line. On the middle of the wing is an inconspicuous dark brown dot, and just below on the fold is a similar dot. Around the apical edge is an indistinct row of small diffused blackish dots at base of cilia. Hindwings fully as wide as forewings, yellowish white. Abdomen ocherous fuscous. Legs ocherous, sprinkled with black. Tarsi black with each joint tipped with yellow.

Alar expanse.—13 to 17 mm.

Habitat.—Texas, Colorado, Arizona.

Type.—No. 6387, U.S.N.M.

Described from many Texan specimens, from Mr. William Beutenmüller's collection, and from specimens collected by Messrs. E. A. Schwarz and H. S. Barber in Colorado and Arizona.

It is a very distinct species, recognized by the pale color and the three black costal spots. The ornamentation recalls *Epithectis bicostomaculella* Chambers [p. 817.]

GELECHIA DYARIELLA, new species.

Gelechia dyariella Busck, Dyar's List Amer. Lep., No. 5749, 1903.

Antennæ whitish fuscous, indistinctly annulated with darker fuscous. Labial palpi with normal well-developed brush; terminal joint shorter than second; whitish suffused with bluish black scales on the outside; brush and terminal joint nearly black. Face white with a few light fuscous scales. Ground color of head, thorax, and forewings whitish, but so heavily overlaid with dark fuscous and bluish black scales as to give the appearance to the naked eye of dark gray. At the base is an oblique, ill-defined, obscure, blackish streak; on the middle of the wing is a black oval dot followed by a short space of pure white; at apical third is a large transverse blackish area across the wing, edged on the outside by a narrow zigzag white fascia. Hindwings as broad as forewings, light silvery fuscous, darker toward apex; cilia yellowish fuscous. Abdomen silvery gray; first segments velvety yellow on upper side; under side white. Legs white, profusely sprinkled with bluish black scales.

Alar expanse.—14 to 18 mm.

Food plant.—Cottonwood.

Habitat.—Colorado.

Type.—No. 6388, U.S.N.M.

An obscurely marked species near the following, *Gelechia albisparsella*. Described from a large series bred by Dr. Dyar, who has given me the following notes on the larva:

Larva.—Resembling the larva of *Nyteola* (*Sarothripa*). Slender, thorax and joint 13 smaller than the other segments, submoniliform; head whitish testaceous, darker in the sutures and vertex, ocelli black. Body all rather opaque soft green, the incisures folded, dorsal vessel dark green, male glands whitish, small. Cervical shield like the body, but more shining and luteous tinted; feet normal, pale; joint 13 dorsally dark punctate. Tubercles ia and ib separate, iia+iiib, iv+v, the latter on both thorax and abdomen.

On cottonwood, Denver, Colorado. Folding up a young leaf by uniting the edges around the margin so that it forms a bag or box; solitary. The larvæ turned pink on leaving the bags to spin. Imago July 3.

GELECHIA ALBISPARSELLA Chambers.

Depressaria albisparsella CHAMBERS, Can. Ent., IV, 1872, p. 92 and p. 128.

Cirrho platanella CHAMBERS, Can. Ent., IV, 1872, p. 146; Bull. U. S. Geol. Surv., IV, 1878, pp. 118, 146.—RILEY, Smith's List Lep. Bor. Am., No. 5285, 1891.

Gelechia albisparsella Busck, Dyar's List Amer. Lep., No. 5750, 1903.

Two undoubtedly authentic types of this species labeled by Chambers, *Cirrho platanella*, are found in the Museum of Comparative Zoology in Cambridge and prove that the genus *Cirrho*, which can hardly be said to have been characterized by Chambers' few lines of general remarks, is synonymous with *Gelechia*. Chambers changed his specific name when he discovered the food plant, which was not admissible, and the species must be known under its original specific name.

Food plant.—*Plantanus occidentalis*.

Habitat.—Kentucky.

GELECHIA UNCTULELLA Zeller.

Gelechia unctulella ZELLER, Verh. k. k. zool.-bot. Gesell. Wien., XXIII, 1873, p. 257.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 147.—RILEY, Smith's List Lep. Bor. Am., No. 5503, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5751, 1903.

The unique type in good condition is in Cambridge Museum. Zeller mentions only two black dots, one on the disk and one at the end of the disk, and says: "Andere Zeichnungen fehlen." These two spots are the most prominent and the only ones seen in certain lights against the nearly black general color of the wing, but as a matter of fact there is, as type also shows, three other smaller black spots on the fold and one more on the disk. All of the spots, however, are quite indistinct.

In the U. S. National Museum is a very large bred series of this species from Colorado and Arizona, bred respectively by Dr. H. G. Dyar and Mr. E. A. Schwarz from *Thermopsis* and from *Robinia*.

Dr. Dyar has published his notes on the larva.¹

According to Mr. Schwarz, this species is at some places so abundant as to do actual damage, spinning up every leaflet of the *Robinia*.

GELECHIA OBSCUROOCELELLA Chambers.

Gelechia obscuroidella CHAMBERS, Cin. Quart. Journ. Sci., II, 1875, p. 254; Bull. U. S. Geol. Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5424, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5752, 1903.

Type of this species is lost, and no authentic specimen is found, but I have with little hesitation determined from description as this species a specimen from San Antonio, Texas, collected in May, which in every respect agrees with Chambers' description, and which, I have no doubt, truly represents this species.

GELECHIA VERSUTELLA Zeller.

Gelechia versutella ZELLER, Verh. k. k. zool.-bot. Gesell. Wien., XXIII, 1873, p. 253.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 148.—BUSCK, Dyar's List Amer. Lep., No. 5753, 1903.

¹Proc. U. S. Nat. Mus., XXV, 1902, p. 407.

The unique type of this species is found in the Cambridge Museum in excellent condition. A good bred series in the U. S. National Museum carefully compared with the type bears the designation "U. S. Dept. of Agriculture Insectary, Nos. 4232 and 5786," and the corresponding records show that it has been bred twice, first from larva skeletonizing leaves of cottonwood, received from El Paso, Texas, in November, 1887, from which the moths issued in January next year. The note on the larva is very short:

Greenish white, with a pink blush on dorsal surface.

Secondly, it was received in July, 1893, from Jetsam, Wyoming, with the report that the larvæ were extremely injurious to cottonwood. With this is the following note on the larva:

Head pale brown, with posterior margin black; body pale yellowish white without any markings. The moths issued July 3 to 8.

The Texan specimens average a little lighter and smaller than those from Wyoming, but they are undoubtedly same species. The type, although from Texas, agrees with the darker Wyoming specimens. Finally, there is in the National Museum one specimen of this species, bred by Dr. Dyar from cottonwood in Colorado.

This species is extremely similar to the following in ornamentation and easily mixed with it. The palpi, however, give a good distinguishing character. In the present species the brush is normal and well developed, longer at base than at apex of second joint, while *Gelechia lynceella* has a very short and even brush. The palpi also show color differences as pointed out by Zeller.

GELECHIA LYNCEELLA Zeller.

Gelechia lynceella ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 255.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5403, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5754, 1903.

Type is found in good condition in the Cambridge Museum. I have met with no other specimen. Very similar to the foregoing.

Habitat.—Texas.

GELECHIA BICOSTOMACULELLA Chambers.

Depressaria bicostomaculella CHAMBERS, Can. Ent., IV, 1872, pp. 127, 147; Bull. U. S. Geol. Surv., IV, 1878, p. 138.

Adrastra quercifoliella CHAMBERS, Can. Ent., IV, 1872, p. 206; V, 1873, p. 174.

Gelechia quercifoliella, CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 146.—RILEY, Smith's List Lep. Bor. Am., No. 5461, 1891.

Psoricoptera gibbosella CHAMBERS (not Stainton), Can. Ent., V, 1873, p. 72.

Gelechia bicostomaculella DIETZ, Smith's List Ins. N. Jersey, 1900, p. 474.—BUSCK, Dyar's List Amer. Lep., No. 5755 1903.

Not *Gelechia bicostomaculella* CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 127; IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5322, 1891.

The second species which Chambers described as *Gelechia bicostomaculella* from Colorado is an *Epithectis* and is treated on p. 817 under that genus.

Of the present species no authentic type is in existence, but in the U. S. National Museum are two specimens determined by Lord Walsingham, and similar specimens in the collection of Dr. Dietz and Professor Fernald, also determined as *bicostomaculella* by Lord Walsingham. Some of these specimens are bred by Miss Murtfeldt from oak, and bear her breeding number 174 M. Miss Murtfeldt thinks this the true *bicostomaculella*, and as it agrees with Chambers' description it seems altogether probable that this truly is that species.

The species is near the following and *Gelechia vernella* Murtfeldt, but has raised scales on the forewings, in which character, as well as in the stalked veins 6 and 7 in the hindwings and the slightly parted veins 3 and 4 it approaches the genus *Telphusa*.

GELECHIA NIGRIMACULELLA, new species.

Gelechia nigrimaculella RILEY, Smith's List Lep. Bor. Am., No. 5418, 1891.—
BUSCK, Dyar's List Amer. Lep., No. 5756, 1903.

In Riley's List of Tineina is found, under no. 5418, the name *Gelechia nigrimaculella* Chambers, and in U. S. National Museum is a large apparently bred series labeled with this same name. But no description has ever been printed of the insect, which I now describe under the old manuscript name given by Chambers.

Antennæ dark fuscous. Labial palpi with normal well-developed brush; ocherous strongly suffused with black except tips of second and third joint, which are clear ocherous. Face, head, and thorax brownish sprinkled with fuscous and blackish scales. Ground color of forewings whitish fuscous but obscured by a liberal sprinkling of dark-brown and black scales. An ill-defined longitudinal streak below costal edge is whitish; costal edge nearly black; on the middle of the disk is an oblique short black dash, and just below this a similar one. At apical third is an obscure outwardly angulated narrow white fascia, and just before this is a costal and a dorsal blackish spot nearly reaching each other. Cilia whitish.

Hindwing as broad as forewings, light fuscous, darker toward tip. Abdomen yellowish fuscous above, below white. Legs whitish sprinkled with black; tarsal joints black tipped with white.

Alar expanse.—13 to 15 mm.

Habitat.—New York, New Jersey.

Type.—No. 6389 U.S.N.M.

Very close to the Californian *Gelechia occidentella* Chambers, but differing by its dark face. Described from many specimens collected by Mr. William Beutenmüller, and found in U. S. National Museum labeled "*Gelechia nigrimaculella* Chambers."

GELECHIA MACULIMARGINELLA Chambers.

Gelechia maculimarginella CHAMBERS, Can. Ent., VI, 1874, p. 241.—BUSCK, Dyar's List Amer. Lep., No. 5757, 1903.

Gelechia maculomarginella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5405, 1891.

Authentic types of this species are found in Professor Fernald's collection and in the Cambridge Museum; the latter are in miserable condition, but agree with Professor Fernald's type as far as can be made out and with Chambers' descriptions. I have bred large series of this species in the District of Columbia and vicinity. The larva feeds on different kinds of oak, and there are at least two generations in this locality. The larva is among the earliest found in the spring (April) in the half-developed unfolded leaves or buds.

The imago of this brood is in the middle of May. In June there is a second brood feeding between two spun-together leaves; imagoes issue in the latter part of July.

Very probably there is a third autumn brood, which either overwinter and lay eggs in early spring, in the swelling leaf buds, or which lay their eggs on the bud, all ready in the autumn.

The easily recognized larva is slender and very agile. Head and thoracic plate polished jet black; first and second thoracic segments deep purple, third, lighter purple with anterior half white. Abdominal segments whitish with four (two on each side) longitudinal purple lines connected on each joint by a broad purple band, which sends two small dorsal projections forward into the white part on each joint.

Thoracic feet and anal plate black; length of full-grown larva 14 mm.; width of head 0.9 mm.

This species as well as *Gelechia vernella* and *Gelechia bicostomaculella* have the hairs on vein 1b in the hindwings of the male strongly developed, resembling a tuft or pencil of long blackish hairs.

GELECHIA BIMINIMACULELLA Chambers.

Gelechia biminimaculella CHAMBERS, Cinn. Journ. Nat. Hist., II, 1880, p. 183.—

RILEY, Smith's List Lep. Bor. Am., No. 5327, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5758, 1903.

The type in Cambridge Museum of this species, with Chambers' label on the pin and agreeing with his description, was found to be identical with a series in U. S. National Museum bred from oak in Missouri by Miss Murtfeldt, and determined by her as this species. I have not met with other specimens.

GELECHIA PSEUDOACACIELLA Chambers.

Depressaria pseudoacaciella CHAMBERS, Can. Ent., IV, 1872, pp. 9, 107, 129, 147, 148.

Gelechia pseudoacaciella CHAMBERS, Cinn. Quart. Journ. Sci., I, 1874, p. 208; Geol. Surv. Bull. U. S., IV, 1878, p. 146; Psyche, III, 1880, p. 65.—RILEY, Smith's List Lep. Bor. Am., No. 5453, 1891.

Gelechia cecella ZELLER, Verh. k. k. zool.-bot. Gesell., Wien, XXIII, 1873, p. 252.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 142.—RILEY, Smith's List Lep. Bor. Am., No. 5331, 1891.

Of this very common insect, the larva of which was shortly described by Chambers, there is a large series in U. S. National Museum, among which are specimens determined by Chambers and by Lord Walsingham. I have repeatedly bred it from *Robinia pseudacacia* around Washington, and I have seen it from most of the Eastern States.

The specimens, which Riley bred from wild cherry, and which Chambers could not distinguish from *pseudoacaciella*,¹ are still in U. S. National Museum and belong to another perfectly distinct though quite similar species, described in this paper as *Gelechia serotinella*.

I am indebted to Lord Walsingham for the synonymy of Zeller's *Gelechia cecella*, type of which is in his possession and which he has given me his manuscript notes on.

The description fully bears out this synonymy.

GELECHIA SEROTINELLA, new species.

Gelechia serotinella BUSCK, Dyar's List Amer. Lep., No. 5760, 1902.

Gelechia pseudoacaciella CHAMBERS, Psyche, III, 1880, p. 65.

Antennæ shining purplish black, with very narrow white indistinct annulations; labial palpi with second joint above whitish, strongly sprinkled with black scales; under side of the well-developed brush black; terminal joint black, with extreme tip and a few scattered scales white.

Face whitish, overlaid with dark purple. Head and thorax clothed with mixed white and purplish black scales, the latter predominating; forewings dark, black and white scales irregularly mixed, but the black prevailing; in a narrow longitudinal streak along but below costal edge dark-brown scales are also freely intermixed, giving that part of the wing a perceptible chocolate-brown shade. At the end of this streak at apical fourth the white scales congregate in an ill-defined costal white spot, which is connected with an opposite equally ill-defined dorsal white spot by a wavering interrupted narrow white fascia. Cilia dark fuscous, intermixed with white and with two faint blackish lines parallel with the edge of the wing.

Hindwings as broad as forewings, dark shining fuscous; cilia, light fuscous; abdomen above on the first segments velvety yellowish brown; the other segments and under side very dark shining fuscous; legs with white and dark purple scales intermixed; posterior tibia on the outside black, with two white bars, on the inside silvery white; tarsal joints black, tipped with white.

Alar expanse.—16 to 21 mm.

Food plant.—*Prunus serotina*.

¹ Psyche, III, 1880, p. 65.

Habitat.—District of Columbia; Colorado.

Type.—No. 6390, U.S.N.M.

The species is very near the foregoing, *pseudocacaciella*, and it was very natural that Chambers, from the imago alone, should identify it as that species; but it is a larger and darker insect, without the whitish costal area found in *pseudocacaciella*.

The egg of this species is laid on the upper side at the tip of a leaf of wild cherry. The young larva spins together the edges of the leaf, and as it grows it folds gradually the entire leaf into a roomy abode, the open end of which it covers with a glistening white, thickly woven sheet of silk. In this cell the larva lives in a black tube made from its own frass and spun firm by silk, and it feeds under the protecting sheet of silk, which is gradually enlarged and moved outward as new feeding ground is needed. The larva is very timid and retreats at the least disturbance into its tube of frass, which it, when full grown, forms into an oval cocoon, in which it pupates. The imago issues within the cell and breaks through the sheet of silk.

The larva is very similar to that of *pseudocacaciella*. When young it has a black head and thoracic shield, body dirty greenish white, darkest on the under side, and with two narrow longitudinal dark-brown dorsal lines and four (two on each side) broader lateral lines through all the segments.

When full grown the larva measures 20–24 mm. in length, with head 1.6 mm. broad. Head and thoracic shield is then light brown, the ground color of the body more nearly white, and the stripes more reddish.

Dr. Dyar, who has bred this insect from larva with identical habits in Colorado, has kindly given me the following technical description of the larva:

Head broad, red-brown, sutures and ocellar area blackish. Body purple brown with white stripes, narrower than the intervening spaces; irregular dorsal line, subdorsal (over tubercles i and ii), lateral (over iii), and broken, broad, distinct, subventral (over iv + v and vi). Feet brownish; cervical shield black behind and shading to sordid white before, rather transparent on anterior rim; prespiracular tubercle black. Tubercles small, brown. Thoracic feet black; anal plate luteous; setæ fine and pale; abdominal feet reddish, those of joint 13 partly pale.

In the locality of Washington there are two annual generations. The young larvæ are first found in May, and in early June they are full grown and already pupated. Imagoes issue late in July and early in August, and lay their eggs soon after, producing the second generation, which overwinters as full-grown larva in its cocoon and issues as imago next spring.

The peculiar life mode of the larva and its elaborate architecture reminded me at once, when I found it two years ago, of Clemens' description of his genus *Catastega*, which was founded solely on the

habit of the larva. As Dr. Dyar has since shown,¹ this genus must be included in the Tortricidæ, and has nothing to do with the present species; but the life mode is identical with that described by Clemens, and illustrates how dangerous it is to rely on earlier stages alone in making new specific and generic groups.

GELECHIA VERNELLA Murtfeldt.

Gelechia formosella MURTFELDT (not Hübner), Can. Ent., XIII, 1881, p. 243.—RILEY, Smith's List Lep. Bor. Am., No. 5364, 1891.

Gelechia vernella MURTFELDT, Can. Ent., XV, 1883, p. 139.—RILEY, Smith's List Lep. Bor. Am., No. 5508, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5761, 1903.

Cotypes of this species are in U. S. National Museum, and I have obtained additional material through the kindness of Miss Mary Murtfeldt.

Food plant.—Oak.

Habitat.—Missouri.

I have not recognized this species from other localities.

GELECHIA SEQUAX Haworth.

Recarvaria sequax HAWORTH, Lepidoptera Brit., 1829, p. 552.

Gelechia (Teleia) sequax STAUDINGER and REBEL, Cat. Lep. Eur., II, No. 2741, 1901.—ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 265.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 147.—RILEY, Smith's List Lep. Bor. Am., No. 5478, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5762, 1903.

This European species was included in the American list, on Zeller's authority, from Massachusetts.

I have not met with any specimen from America, and it seems probable that some mistake was made in the labeling of Zeller's specimen or in his determination.

In the U. S. National Museum is a good series of European specimens.

The larva lives, according to Meyrick, in spun shoots of *Heli-anthemum*.

GELECHIA OCCIDENTELLA Chambers.

Gelechia occidentella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 246; Bull. U. S. Geol. Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5427, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5763, 1903.

In the Museum of Comparative Zoology, in Cambridge, are found three probably authentic types of this species. They are true *Gelechia* and can be recognized also specifically, although they are in poor condition and have lost their palpi. I have met with no specimens exactly like them.

Habitat.—California.

¹See p. 852.

GELECHIA MEDIOFUSCELLA Clemens.

Gelechia mediofuscella CLEMENS, Proc. Ent. Soc. Phila., II, 1863, pp. 11, 121; Stainton Ed. N. Am. Tin., 1872, pp. 218, 224.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5407, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5764, 1905.

Gelechia vagella WALKER, Cat. Lep. Het. Brit. Mus., XXIX, 1864, p. 596.—WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 178.—RILEY, Smith's List Lep. Bor. Am., No. 5506, 1891.

Depressaria fuscoochrella CHAMBERS, Can. Ent., IV, 1872, pp. 106, 129, 147, 148.

Gelechia fuscoochrella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 143.

Gelechia (*Lita*) *litucosella* ZELLER, Verk. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 265.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 144.

To Lord Walsingham is due the credit for the entire synonymy. I am indebted to him for his manuscript note that *mediofuscella* should be added to the already published synonymy, which the description also bears out.

It is a common species in the District of Columbia, which I have taken in numbers in very early spring (March, April), and again in July.

Its life history is unknown as yet, but a clew may be found in a specimen which issued, April 25, from old, dry cornstalks collected and placed in breeding case the previous fall. This specimen was perfect and seemingly fresh, but not having observed the larva. I am unable to say with certainty that it was not an overwintering moth or that the larva accidentally had found a convenient pupating place in the cornstalks.

GELECHIA WALSINGHAMII Dietz.

Pseudochelaria walsinghamii DIETZ, Ent. News, XI, 1900, p. 352, pl. 1, fig. 3.

Gelechia walsinghamii WALSINGHAM and DURRANT, Ent. Mo. Mag., XXXVIII, 1902, p. 28.—BUSCK, Dyar's List Amer. Lep., No. 5765, 1903.

Through the kindness of Dr. Dietz I have examined his types of this species and the National Museum possesses several cotypes. It is a typical *Gelechia*, which was placed by error in an unpublished manuscript genus of Lord Walsingham's, thereby spoiling the name *Pseudochelaria* for future application to the intended—to me unknown—genus.

Food plant.—*Rhus typhosa*.

Habitat.—Pennsylvania.

GELECHIA PENNSYLVANICA Dietz.

Pseudochelaria pennsylvanica DIETZ, Ent. News, XI, 1900, p. 353, pl. 1, fig. 4.—WALSINGHAM, Ent. Mo. Mag., XXXVIII, 1901, p. 29.

Gelechia pennsylvanica BUSCK, Dyar's List Amer. Lep., No. 5766, 1903.

As this species must be credited to Dr. Dietz it was proper that he

should describe it, and he has kindly handed me the following description of the moth which he figured.¹

Ashen gray, palpi with third joint longer than second, latter dark brownish at base externally, former dusted with fuscous, base and extreme apex white. Antennae faintly annulate with fuscous. Thorax with dark-brown spot posteriorly. Forewings marked with dark rich brown as follows: A trapezoidal space at base sharply limited externally by an oblique line nearer the base at the dorsal margin and slightly concave toward the apex. This space is separated from the costal margin by a pale area. An irregular stripe extends through the entire wing to apex, shading off gradually toward the costa. A transverse pale line at the beginning of the cilia, oblique in its dorsal half, concave toward the apex in its costal part. Apical part of wing with dark lines. Cilia gray with two dark lines. Posterior wings pale fuscous. Underside paler. Legs, except posterior pair, fuscous, annulated with black.

Alar expanse.—17 mm.

Habitat.—Hazleton, Pennsylvania.

Type.—In Dietz's collection.

Described from a single specimen taken at light. Closely allied to *Gelechia walsinghami* Dietz.

I have seen no other specimen of this species which, in my judgment, is a true *Gelechia*, and not what it was supposed to be, the type of *Pseudochelaria* Walsingham manuscript.

GELECHIA TEPHRIASELLA Chambers.

Gelechia tephriasella CHAMBERS, Can. Ent., IV, 1872, p. 68; Cinn. Quart. Journ. Sci., II, 1875, p. 253; Bull. U. S. Geol. Surv., IV, 1878, p. 147.—WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 181.—RILEY, Smith's List Lep. Bor. Am., No. 5490, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5767, 1903.

No authentic type of this species exists, but in the U. S. National Museum is a specimen which has on the pin one of Chambers' pill-box labels with *Gelechia tephriasella* in his handwriting. This specimen consists of only thorax and the two forewings, but these latter agree with Chambers' description and the specimen presumably truly represents this species.

While the genus can not be determined with certainty from these two forewings, the species appears to belong near the following, a probability which is strengthened by Chambers' description and his observation² that this species reminded him of *grissefasciella* (*conclusella* Walker).

However, the generic determination must stand only for what it is, liable to change through future evidence.

The venation in the forewings is normal 12 veins, 7 and 8 stalked, rest separate (not as in the following with veins 3 and 4 stalked). The peculiar coloration of the antennae described by Chambers should make recognition of this species easy.

Habitat.—Kentucky.

¹ Ent. News, XI, pl. 1, fig. 4.

² Cinn. Quart. Journ., II, p. 253.

GELECHIA CONCLUSSELLA Walker.

Gelechia conclusella WALKER, Cat. Lep. Het. Brit. Mus., XXIX, 1864, p. 593.—WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 179.—RILEY, Smith's List Lep. Bor. Am., No. 5341, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5768, 1903.

Gelechia grissefasciella CHAMBERS, Cinn. Quart. Journ. Sci., 11, 1875, p. 253; Bull. U. S. Geol. Surv. IV, 1878, p. 144.

In the U. S. National Museum are several specimens labeled by Lord Walsingham, *Gelechia conclusella* Walker; these are identical with specimens thus named by Lord Walsingham in collections of Dr. Dietz, and in the Philadelphia Academy of Natural Sciences. They agree with Walker's description and evidently correctly represent his species.

They are the same as type no. 447, in the U. S. National Museum, of *Gelechia grissefasciella*, received with his label from Chambers, thus confirming the synonymy made by Walsingham. There is one other supposed "type" of *grissefasciella*, namely, in the Museum of Comparative Zoology, Cambridge, but this is an entirely different thing, an undescribed species of *Nalyda*, unhappily unfit for description; it does not, however, agree with Chambers' description, while U. S. National Museum type does, and the latter is evidently authentic.

Lord Walsingham also made *crensentifasciella* Chambers a synonym of *conclusella*, but this, as previously shown (p. 846), was done on faulty evidence, and *crensentifasciella* is a distinct species belonging to *Anacampsis*.

The present species has veins 3 and 4 in forewings stalked, and thereby differs from the most of the species in the genus in which it is placed. I am, however, at present not willing to differentiate it generically.

GELECHIA RILEYELLA Chambers.

Depressaria rileyella CHAMBERS, Can. Ent., IV, 1872, pp. 106, 129, 147, 148; Bull. U. S. Geol. Surv., IV, 1878, p. 138.—RILEY, Smith's List Lep. Bor. Am., No. 5277, 1891.

Gelechia rileyella RILEY, Smith's List Lep. Bor. Am., No. 5468.—BUSCK, Proc. U. S. Nat. Mus., XXIV, 1902, p. 732; Dyar's List Amer. Lep., No. 5769, 1903.

Type no. 462, in the U. S. National Museum, of *Depressaria rileyella*, bearing Chambers' handwritten label and the date 1872, is the same as three types found in the Museum of Comparative Zoology in Cambridge, also bearing Chambers' labels.

These types are all in very poor condition specifically, but prove conclusively that the species is a true *Gelechia*.

The type in the National Museum bears Lord Walsingham's blue label no. 1170, and there is also a better preserved specimen determined by Walsingham and bearing his blue label no. 1211.

Habitat.—Kentucky, Canada.

No other specimens are known to me.

GELECHIA NUNDINELLA Zeller.

Gelechia nundinella ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 256.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5420, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5770, 1903.

Gelechia beneficentella MURTFELDT, Can. Ent., XIII, 1881, p. 245.—RILEY, Smith's List Lep. Bor. Am., No. 5321, 1891.

Zeller's type in the Cambridge Museum of *Gelechia nundinella* proves, as the description would indicate, that it is the same as Miss Murtfeldt's later-described *beneficentella*, of which good bred series are found in the U. S. National Museum, besides authentic specimen received from Miss Murtfeldt.

Food plant.—*Solanum carolinense*.

Habitat.—Missouri (Murtfeldt), Texas (Zeller, Boll), District of Columbia (Busck).

GELECHIA MONUMENTELLA Chambers.

Gelechia monumentella CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 125; U. S. Geol. Surv. Bull., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5413, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5771, 1903.

The unique type of this species is found in good condition in the Cambridge Museum, agreeing with the description, and labeled "Colorado," with the name in Chambers' handwriting.

The type shows one point not mentioned by Chambers, namely, a thin, indistinct, but complete white fascia at apical third.

In the U. S. National Museum there is a large series of this very distinct insect, bred by Mr. Coquillett and Mr. Koebele in California from *Franseria grandiflora*.

GELECHIA OBSCUROSUFFUSELLA Chambers.

Gelechia obscurosuffusella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, pp. 90, 145.—RILEY, Smith's List Lep. Bor. Am., No. 5425, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5772, 1903.

Type no. 456, in the U. S. National Museum, of this species from Chambers agrees with other types examined in the Cambridge Museum and in Professor Fernald's collection. All are in rather poor condition, but agree so far as can be made out with Chambers' description and prove that the species is a true *Gelechia*.

I have met with no other specimens.

Habitat.—Texas.

GELECHIA PETASITIS Pfaffenzeller.

Gelechia petasitis PFAFFENZELLER, Stett. Ent. Zeit., XXVIII, 1867, p. 79.—STAUDINGER and REBEL, Cat. Lep. Eur., II, 1901, No. 2588.—WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 178.—RILEY, Smith's List Lep. Bor. Am., No. 5445, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5773, 1903.

I have examined in Professor Fernald's collection three specimens which Lord Walsingham determined as the European insect.

One of these, through the kindness of Professor Fernald, is now the property of U. S. National Museum. It agrees with Pfaffenzeller's description.

The European food plant is *Petasitis niveus*, on which the larva mines the leaves. Other species of *Petasitis*, on which the species may live, occur in this country.

GELECHIA PANELLA, new species.

Gelechia panella Busck, Dyar's List Amer. Lep., No. 5774, 1903.

Antennæ dark reddish fuscous, annulated with white. Labial palpi with well developed furrowed brush; second joint on the upper and inner side whitish, the outside and the brush deep purplish red. Face white with a reddish tint. Head, thorax, and forewings uniformly bright brick red; at the end of the cell is a very indistinct blackish dot and at apical third is a still more indistinct very narrow oblique yellowish white fascia across the wing. No other markings are found, and those mentioned are easily overlooked. Cilia reddish, sprinkled with white. Under side of forewings shining dark fuscous. Hindwings broader than forewings, light silvery fuscous, darker and yellowish toward apex. Cilia yellowish fuscous. Abdomen dark fuscous, underside ochreous. Forelegs reddish, posterior legs yellow sprinkled with black; tarsal joints blackish, slightly tipped with yellow.

Alar expanse.—20 mm.

Habitat.—Arizona, California.

Type.—No. 6391, U.S.N.M.

This striking species, which can not be confused with any other described American *Gelechia*, is described from two perfect specimens, one collected in Arizona by Mr. E. A. Schwarz and the other probably bred by Mr. Koebele at Los Angeles, California.

GELECHIA ABELLA, new species.

Gelechia abella Busck, Dyar's List Amer. Lep., No. 5775, 1903.

Antennæ silvery white sharply annulated with dark fuscous. Labial palpi with rather small brush pure silvery white. Face and head pure white. Thorax suffused with fuscous; forewings white but so thickly suffused with fuscous as to obliterate the white ground-color except on apical third of the wing, which is pure white. Near base is an ill-defined oblique costal streak with only a few dark scales therefore appearing whitish against the darker surrounding parts. Cilia white. Hindwings as broad as forewings, light fuscous. Abdomen yellowish fuscous. Legs gray with white bars on the outside.

Alar expanse.—15 mm.

Habitat.—Colorado.

Type.—No. 6392, U.S.N.M.

This species which, by its peculiar coloration, probably imitates bird-droppings can not be mistaken for any other described species and is at once recognized by its pure white head, palpi, and apical third of the forewings.

GELECHIA FUSCOTÆNIAELLA Chambers.

Gelechia fuscotæniaella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, pp. 89, 143.—

BUSCK, Dyar's List Amer. Lep., No. 5776, 1903.

Gelechia fuscotæniella RILEY, Smith's List Lep. Bor. Am., No. 5374, 1891.

Gelechia fuscolinianaella RILEY, Smith's List Lep. Bor. Am., No. 5370, 1891.

Type no. 451 in the U. S. National Museum of this species is labeled by Chambers *fuscotæniella*, which, through misreading, led Riley to include the name *fuscolinianaella* in his list. This name consequently refers to the present species.

The type is identical with specimens in the Museum of Comparative Zoology in Cambridge, rightly labeled by Chambers. Both are in rather poor condition, but easily recognized from description by the pure white forewings with the sharply limited dark brown base.

The types are from Texas; in the National Museum there is also a better preserved specimen from Colorado.

B.—Unrecognized Species.

GELECHIA ADAPTERELLA Walker.

Gelechia adapterella WALKER, Cat. Lep. Het. Brit. Mus., XXIX, 1864, p. 590.—

BUSCK, Dyar's List Amer. Lep., No. 5778, 1903.

This species was omitted in Riley's list. The type should be examined in the British Museum. Habitat not given by Walker.

GELECHIA ALBISTRIGELLA Chambers.

Gelechia albistrigella CHAMBERS, Can. Ent., IV, 1872, p. 171.—HAGEN, Papilio,

IV, 1884, p. 98.—RILEY, Smith's List Lep. Bor. Am., No. 5304, 1891.

BUSCK, Dyar's List Amer. Lep., No. 5779, 1903.

Two types of this species are in the Museum of Comparative Zoology in Cambridge, but in so poor condition that they can not be recognized with any degree of positiveness. They are, however, probably authentic, and remind one, as Chambers says, of *Strobisia*. As far as can be made out, without injuring the specimens, the forewings, which are obtusely rounded, have 11 veins, 8 coincident with 7, 3 and 4 stalked. Hindwings with 8 veins, 3 and 4 connate, 6 and 7 connate. Labial palpi with second joint considerably thickened with smoothly appressed scales, abruptly cut off at apex; terminal joint shorter than second joint.

However, it was so difficult to examine these specimens that I feel uncertain about the characters and must at present leave the species as unrecognized.

It is a rather striking insect and should easily be recognized from the description if found again.

Habitat.—Kentucky.

GELECHIA AMBROSICELLA Chambers.

Gelechia ambrosiella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 239; Bull. U. S. Geol. Surv., IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5308, 1901.—BUSCK, Dyar's List. Amer. Lep., No. 5780, 1902.

Chambers sent out to correspondents several specimens of a Tineid labeled: *Sinoë ambrosiella*, which he afterwards determined¹ as specimens of *Butalis matutella* Clemens. One of these was sent to U. S. National Museum, and when Riley made his List of 'Tineina he came across this specimen and recognizing Chambers' label, placed an asterisk by *ambrosiella* in his list, indicating that a specimen was found in the museum collection, without recognizing the faulty determination.

No types or recognized specimen of the present species are found in any of the collections, and I have failed to breed the species, although making several efforts. But the knowledge of the foodplant and larval habits [the larva feed according to Chambers in the fruits of *Ambrosia trifida*] together with the description insure ultimate rediscovery of the species, which Chambers thought very near to *Trichotaphe chambersella* Murtfeldt (p. 913).

GELECHIA AMORPHELLA Chambers.

Gelechia amorphella CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 124; IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5309, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5781, 1902.

All authentic specimens of this species are lost and I have not recognized it from the description in the material examined, but continued collecting and breeding in Colorado ought to enable recognition of the species, the food plant of which Chambers gave with some doubt as *Amorpha fruticosa*.

GELECHIA ANGUSTIPENNELLA Clemens.

Gelechia angustipennella CLEMENS, Proc. Ent. Soc. Phila., II, 1863, p. 119; Stainton Ed. N. Am. Tin., 1872, pp. 222, 224.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5311, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5782, 1902.

The type is lost and I have not recognized the species; the description gives no clew to the proper genus.

Habitat.—Pennsylvania?

¹Can. Ent., V, p. 231.

GELECHIA ARGENTIALBELLA Chambers.

Gelechia argentialbella CHAMBERS, Can. Ent., III, 1874, p. 241; Bull. U. S. Geol. Surv., IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5313, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5783, 1902.

No authentic material exists of this species, which, according to Chambers, is very like *Recurvaria variella* Chambers [p. 809].

Habitat.—Texas.

GELECHIA ATTRITELLA Walker.

Gelechia attritella WALKER, Cat. Brit. Mus., XXIX, 1864, p. 592.—BUSCK, Dyar's List Amer. Lep., No. 5784, 1902.

The type of this species should be examined in British Museum. The description gives no clue to the proper genus.

Habitat.—Not given.

GELECHIA DISCOMACULELLA Chambers.

Gelechia discomaculella CHAMBERS, Can. Ent., IV, 1872, p. 172; Cinn. Quart. Journ. Sci., II, 1875, p. 239; Bull. U. S. Geol. Surv., IV, 1878, p. 143.—RILEY, Smith's List Lep. Bor. Am., No. 5353, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5785, 1902.

Gelechia aurimaculella CHAMBERS, Can. Ent., IV, 1872, p. 172; Bull. U. S. Geol. Surv., IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5316, 1891.

According to Miss Murtfeldt and Lord Walsingham the above synonymy is correct, but no authentic specimens of either species are now preserved. The descriptions read very much alike. According to Chambers this species is "difficult to distinguish from *Gelechia marmorella* Chambers,¹ even on comparison of specimens."

GELECHIA BADIOMACULELLA Chambers.

Gelechia badiomaculella CHAMBERS, Can. Ent., IV, 1872, p. 192; Bull. U. S. Geol. Surv., IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5317, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5786, 1902.

Described from a single specimen taken under a gaslight and with the palpi [at least!] burned. A yellowish and brown species with tufted wings, which will be difficult ever to rediscover with certainty, as it may not even belong to the family Gelechiidae.

Habitat.—Kentucky.

GELECHIA BISTRIGELLA Chambers.

Depressaria bistrigella CHAMBERS, Can. Ent., IV, 1872, pp. 92, 128, 147.

Gelechia bistrigella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 142.—RILEY, Smith's List Lep. Bor. Am., No. 5328, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5787, 1902.

Nothing can be said about the proper genus of this species from the description. Type is lost.

Habitat.—Canada.

¹ *Phthorimaea marmorella*, p. 823.

GELECHIA BRUMELLA Clemens.

Gelechia brumella CLEMENS, Proc. Ent. Soc. Phila., II, 1864, p. 416; Stainton Ed. N. Am. Tin., p. 239, 1872.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 142.—RILEY, Smith's List Lep. Bor. Am., No. 5330, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5788, 1902.

Described from a single somewhat denuded specimen from Labrador, which is no longer in existence.

GELECHIA CANOPULVELLA Chambers.

Gelechia canopulvella CHAMBERS, Bull. U. S. Geol. Surv., 1878, pp. 91, 142.—RILEY, Smith's List Lep. Bor. Am., No. 5332, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5789, 1902.

Of this species the unique type is still in the Museum of Comparative Zoology in Cambridge, but it is in so poor a condition that definite recognition is not possible at the present time. It is, however, without doubt a true *Gelechia*, near, if not the same as *Gelechia obscuronuffusella* Chambers [p. 888].

Habitat.—Texas.

GELECHIA CAPITEOCHRELLA Chambers.

Gelechia capiteochrella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 252; U. S. Geol. Surv. Bull., IV, p. 142.—RILEY, Smith's List Lep. Bor. Am., No. 5333, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5790, 1902.

Can not be placed from description; type is lost; no locality given.

GELECHIA CARYÆVORELLA Packard.

Gelechia caryævorella PACKARD, Rept. U. S. Dept. of Agric., 1885, p. 331, 1886; Rept. U. S. Ent. Comm., V, 1890, p. 314.—RILEY, Smith's List Lep. Bor. Am., No. 5333a, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5791, 1902.

From the knowledge of the larva and the description of the imago it should not be difficult ultimately to rediscover this species, type of which is lost.

According to Professor Fernald it is allied to *Gelechia bicostomaculella* Chambers, and it may prove on discovery to be synonymous with one of the several similar species of that group.

Habitat.—Rhode Island.

GELECHIA CASSELLA Walker.

Gelechia cassella WALKER, Cat. Brit. Mus., XXIX, 1864, p. 594.—RILEY, Smith's List Lep. Bor. Am., No. 5333b, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5799, 1902.

The type of this species should be examined in British Museum. The description gives no clew to its proper genetic position.

Exact habitat not given.

GELECHIA DECEMMACULELLA Chambers.

Gelechia decemmaculella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 290; Bull. U. S. Geol. Surv., III, 1877, p. 128; IV, 1878, p. 142.—RILEY, Smith's List Lep. Bor. Am., No. 5349, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5793, 1902.

Described from a single captured specimen which is now lost. According to Chambers, "it reminds one in ornamentation of *Gelechia difficilisella* Chambers [*Epithectis attributella* Walker p. 817], but is a larger insect with hindwings not excised beneath the tip."

Habitat.—Colorado.

GELECHIA BRACKENRIDGIELLA Busck.

Gelechia detersella CLEMENS (not Zeller), Proc. Acad. Nat. Sci. Phila., 1860, p. 164; Stainton Ed. N. Am. Tin., 1872, pp. 40, 116, 225.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 142.—RILEY, Smith's List Lep. Bor. Am., No. 5351, 1891.

Gelechia brackenridgiella BUSCK, Dyar's List Amer. Lep., No. 5794, 1902.

Cotypes of this species should be examined in British Museum, where the two specimens sent to Stainton by Clemens in 1860 presumably are found.

Stainton thought it allied to the European *Gelechia affinis* Douglas.¹

No types exist in this country of this species, which may be known under the above name instead of the preoccupied name *detersella*.

GELECHIA DISCOANULELLA Chambers.

Gelechia discoanulella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 254; Bull. U. S. Geol. Surv., IV, 1878, p. 143.—BUSCK, Dyar's List Amer. Lep., No. 5795, 1902.

Gelechia discoanulella RILEY, Smith's List Lep. Bor. Am., No. 5352, 1891.

According to Chambers, a pale ochreous species with dark, annulated spot at the end of the cell on forewings.

No type exists. No locality given.

GELECHIA DISCOSTRIGELLA Chambers.

Gelechia discostrigella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 248; Bull. U. S. Geol. Surv., IV, 1878, p. 143.—RILEY, Smith's List Lep. Bor. Am., No. 5356, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5796, 1902.

Described from a single type with palpi missing. This unique type is still preserved in the Museum of Comparative Zoology in Cambridge, but now lacks, besides the palpi, part of all the wings, and it is in such condition as to prohibit generic recognition.

The type shows the species to be a large, broad-shouldered insect, with basal half of forewings white and extreme base blackish brown.

Habitat.—California.

¹*Beyotropha affinis* Standinger and Rebel, Cat. Lep. Eur., No. 2531, 1901.

GELECHIA FLAVICORPORELLA Walsingham.

Gelechia flavicorporella WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 177.—RILEY, Smith's List Lep. Bor. Am., No. 5361, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5797, 1902.

Of this species two types are found in Professor Fernald's collection, but by accident I lost my notes on them and am at present unable to recognize the species.

It is, however, probably a true *Gelechia*.

GELECHIA FLEXURELLA Clemens.

Gelechia flexurella CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 163; Proc. Ent. Soc. Phila., II, 1863, p. 122; Stainton Ed. N. Am. Tin., 1872, pp. 115, 225.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 143.—RILEY, Smith's List Lep. Bor. Am., No. 5363, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5798, 1902.

Type is lost; from Clemens's description I would suppose that this species probably belongs to the genus *Aristotelia*.

Habitat.—Pennsylvania

GELECHIA FUSCOLUTEELLA Chambers.

Depressaria fuscoluteella CHAMBERS, Can. Ent., IV, 1872, pp. 106, 147.
Gelechia fuscoluteella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 143.—RILEY, Smith's List Lep. Bor. Am., No. 5368, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5799, 1902

No authentic specimens exist, and the short description is insufficient for recognition.

Habitat.—Kentucky.

GELECHIA FUSCOMACULELLA Chambers.

Gelechia fuscomaculella CHAMBERS, Can. Ent., IV, 1872, p. 170; Bull. U. S. Geol. Surv., IV, 1878, p. 143.—RILEY, Smith's List Lep. Bor. Am., No. 5369, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5800, 1902.

The unique type of this species in the Museum of Comparative Zoology in Cambridge is in very poor condition, with one forewing and part of the other and of both hindwings gone.

It is impossible to place it with certainty, but I believe it is a true *Gelechia*.

Habitat.—Kentucky.

GELECHIA FUSCOPUNCTELLA Clemens.

Gelechia fuscopunctella CLEMENS, Proc. Ent. Soc. Phila., II, 1863, pp. 12, 121; Stainton Ed. N. Am. Tin., 1872, pp. 218, 225.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 143.—RILEY, Smith's List Lep. Bor. Am., No. 5373, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5801, 1902.

Type is lost and description insufficient for certain generic determination.

Habitat.—Pennsylvania?

GELECHIA GILVOMACULELLA Clemens.

Gelechia gilvomaeculella CLEMENS, Proc. Ent. Soc. Phila., 1863, II, pp. 12, 121; Stainton Ed. N. Am. Tin., 1872, pp. 218, 225.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5381, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5802, 1902.

The type is lost and description insufficient for generic determination.

Habitat.—Pennsylvania?

GELECHIA GLYCYRIZÆELLA Chambers.

Gelechia glycyrizæella CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 124 —BUSCK, Dyar's List Amer. Lep., No. 5803, 1902.

Gelechia glycyrrizæella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5384, 1891.

The unique type of this species is in rather well-preserved condition in the Museum of Comparative Zoology in Cambridge. But I have not been able to find another specimen exactly like it in any of the collections, and as I can not with absolute certainty make out the genus of the type specimen without injuring it, I prefer, therefore, to postpone definite determination of the species until more material is at hand. It is probably a true *Gelechia*. Food plant was given with some doubt by Chambers as *Glycyrrhiza lepidota*.

Habitat.—Colorado.

GELECHIA GRISELLA Chambers.

Gelechia grisella CHAMBERS, Can. Ent., IV, 1872, p. 171; Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5385, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5804, 1902.

The type is lost and the description is insufficient for generic determination.

Habitat.—Kentucky.

GELECHIA GRISEAEELLA Chambers.

Parasia griseaella CHAMBERS, Can. Ent., 1872, IV, p. 88.

Gelechia griseaella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5386, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5805, 1902.

The type is lost and the description insufficient for generic determination.

Habitat.—Canada.

GELECHIA GRISEOCHRELLA Chambers.

Gelechia griseochrella CHAMBERS, Can. Quart. Jour. Sci., II, 1875, p. 247; Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5387, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5806, 1902.

The type is lost. From Chambers' description and his comparison of the venation with that of *Callima argenticinctella* Clemens, it seems

highly probable that this species does not even belong in the family Gelechiidae. However, as it can not at present be placed elsewhere it must remain under the present genus until recognized.

Habitat.—California.

GELECHIA LABRADORICA Moeschler.

Gelechia labradorica MOESCHLER, Wien. Ent. Monatsch., 1864, p. 200.—GROTE, Can. Ent., IV, 1872, p. 125.—CHAMBERS, Bull. U. S. Geol. Surv., IV, p. 144, 1878.—RILEY, Smith's List Lep. Bor. Am., No. 5395, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5807, 1902.

Presumably a true *Gelechia*, but which can not be definitely placed from the description.

Habitat.—Labrador.

GELECHIA LABRADORIELLA Clemens.

Gelechia labradoriella CLEMENS, Proc. Ent. Soc. Phila., II, 1863, pp. 12, 120; Stainton Ed. N. Am. Tin., 1872, pp. 220, 224, 239.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5396, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5808, 1902.

? *Gelechia viduella* FABRICIUS, Staudinger & Rebel, Cat. Lep. Eur., II, No. 2618. 1901.

Placed by Staudinger and Rebel as a synonym of the European *Gelechia viduella* Fabricius, with a question mark. No authentic material of Clemens' is left, but the evidently rather striking species should be recognized from the description when fuller collections from Labrador are obtained.

GELECHIA LACTEUSOCHRELLA Chambers.

Gelechia lacteusoehrella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 244; Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5397, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5810, 1902.

The type of this species is lost and the description gives no evidence of the true generic position of the species.

Habitat.—California.

GELECHIA LITURELLA Walker.

Gelechia liturella WALKER, Cat. Brit. Mus., XXIX, 1864, p. 591.—BUSCK, Dyar's List Amer. Lep., No. 5811, 1902.

Type should be examined in British Museum.

GELCHIA MACULATUSELLA Chambers.

Gelechia maculatusella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 245; Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5404, 1891.—BUSCK, Dyar's List Amer. Lep., 5812, 1902.

The type is lost and the description is insufficient for generic determination.

Habitat.—California.

GELECHIA MILLERIELLA Chambers.

Gelechia milleriella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 253; Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5408, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5813, 1902.

The type is lost and description insufficient for generic determination.
Habitat.—Not given.

GELECHIA MIMELLA Clemens.

Gelechia mimella CLEMENS, Proc. Acad. Nat. Sci., Phila., 1860, p. 163; Proc. Ent. Soc. Phila., II, 1863, p. 121; Stainton Ed. N. Am. Tin., 1872, pp. 116, 225.—CHAMBERS, Can. Ent., IV, 1872, p. 69; Bull. U. S. Geol. Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5409, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5814, 1902.

The type of the species is lost; Chambers thought it similar or possibly even synonymous with his *Gelechia palpiannulella* (*Aristotelia absconditella*, Walker, p. 801), but Clemens expressly said in his synoptic table of his species of *Gelechia* that *mimella* has hindwings with rounded apex, not produced, and it can consequently not be looked for in *Aristotelia*.

Habitat.—Pennsylvania?

GELECHIA OBSCURELLA Chambers.

Gelechia obscurella CHAMBERS, Can. Ent., IV., 1872, p. 170; Bull. U. S. Geol. Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5423, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5815, 1902.

In the Cambridge Museum is found a type of this species, which shows it to be a true *Gelechia* similar to, but different from, *Gelechia monumentella* Chambers [p. 888]. Chambers himself thought it similar to the following unrecognized species. The type is, however, in so poor condition that I have not been able to identify it specifically with certainty, and much fuller collections should be made in Chambers' old hunting grounds in Kentucky before definite determination is attempted.

GELECHIA OBSCURUSELLA Chambers.

Depressaria obscurusella CHAMBERS, Can. Ent., 1872, pp. 106, 129, 148; Bull. U. S. Geol. Surv., IV, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5426, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5816, 1902.

Gelechia fuscopolvella CHAMBERS, Can. Ent., IV, 1872, p. 170; Cinn. Quart. Journ. Sci., II, 1875, p. 245; Bull. U. S. Geol. Surv., IV, 1878, p. 143.—RILEY, Smith's List Lep. Bor. Am., No. 5372, 1891.

Types of both the above species are found in the Cambridge Museum, but in nearly useless condition. They seem, however, absolutely identical so far as comparison is possible, and, as the two descriptions also agree, I have no hesitation in uniting them. The species is probably a

true *Gelechia* and possibly the same as the foregoing species, though I think I am able to differentiate the two excuses for types.

Habitat.—Kentucky, Canada.

GELECHIA OCHERFUSCELLA Chambers.

Gelechia ocherfuscella CHAMBERS, Conn. Quart. Journ. Sci., II, 1875, p. 249.—

BUSCK, Dyar's List Amer. Lep., No. 5817, 1902.

Gelechia ochrefuscella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 145.—

RILEY, Smith's List Lep. Bor. Am., No. 5429, 1891.

Described from a single specimen without palpi, which is now lost. Nothing can be said from the description about the generic position of the species.

Habitat.—California.

GELECHIA ORNATIFIMBRIELLA Clemens.

Gelechia? ornatifimbriella CLEMENS, Proc. Ent. Soc. Phil., II, 1864, p. 420; Stain-

ton Ed. N. Am. Tin., 1872, p. 242.—CHAMBERS, Bull. U. S. Geol. Surv., IV,

1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5435.—BUSCK, Dyar's

List Amer. Lep., No. 5818, 1902.

The types of this species are lost, and Clemens thought it an aberrant from approaching *Depressaria*. As far as his description of the venation and palpi is concerned it fits the present genus, but I have not identified it specifically.

Habitat.—Illinois.

GELECHIA PALLIDAGRISELLA Chambers.

Gelechia pallidagriseella CHAMBERS, Can. Ent., VI, 1874, p. 237.—BUSCK, Dyar's List Amer. Lep., No. 5819, 1902.

Gelechia pallidegriseella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 145.—

RILEY, Smith's List Lep. Bor. Am., No. 5438.

The type is lost. Nothing can be gleaned from the description about the generic position of the species.

Habitat.—Texas.

GELECHIA PALPIALBELLA Chambers.

Gelechia palpialbella CHAMBERS, Conn. Quart. Journ. Sci., II, 1878, p. 253; Bull.

U. S. Geol. Surv., IV, 1878, p. 145.—BUSCK, Dyar's List Amer. Lep., No. 5820, 1902

Gelechia palpiaella RILEY, Smith's List Lep. Bor. Am., No. 5441, 1891.

The type of the species is lost and the description insufficient for correct generic determination. Chambers said it is mistakable for *Gelechia* (*Aristotelia*) *physaliella* Chambers [p. 802].

No habitat is given.

GELECHIA PARVIPULVELLA Chambers.

Gelechia parvipulvella CHAMBERS, Can. Ent., VI, 1874, p. 242; Bull. U. S. Geol.

Surv., IV, 1878, p. 145.—RILEY, Smith's List Lep. Bor. Am., No. 5443, 1891.—

BUSCK, Dyar's List Amer. Lep., No. 5821, 1902.

The type of the species is lost.

The following is a rather extreme but by no means unique example of some of Chambers' descriptions, which will serve to illustrate the difficulties connected with recognizing some of his species of which his types are lost, especially when it is borne in mind, that there is no assurance that the insects he placed under *Gelechia* belongs to the family *Gelechiidae* even:

Palpi simple. Pale yellowish white, lightly dusted with fuscous, the dusting more dense toward the apex of the primaries. Al. exp. $\frac{3}{8}$ inch. Season, May and August. Possibly a variety of *G. subalbusella*.

The description of *Gelechia subalbusella* is still more laconic and reads in full:

Second joint of the palpi not thickened. Creamy white, sparsely dusted with ochreous yellow and brown.

Habitat.—Texas.

• **GELECHIA PULLIFIMBRIELLA** Clemens.

Gelechia pullifimbriella CLEMENS, Proc. Ent. Soc. Phila., II, 1863, p. 120; Stainton Ed. N. Am. Tin., 1872, pp. 223, 225.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 146.—RILEY, Smith's List Lep. Bor. Am., No. 5455, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5822, 1902.

Type is lost and description is insufficient for generic determination of the species.

Habitat.—Pennsylvania?

GELECHIA PULLUSELLA Chambers.

Gelechia pullusella CHAMBERS, Can. Ent., VI, 1874, p. 237; Bull. U. S. Geol. Surv., IV, 1878, p. 146.—RILEY, Smith's List Lep. Bor. Am., No. 5456; BUSCK, Dyar's List Amer. Lep., No. 5823, 1902.

The type is lost and the description is insufficient for determination.

Habitat.—Texas.

GELECHIA PUNCTIFERELLA Clemens.

Gelechia punctiferella CLEMENS, Proc. Ent. Soc. Phila., II, 1864, p. 119; Stainton Ed. N. Am. Tin., 1872, pp. 222, 224.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 146.—RILEY, Smith's List Lep. Bor. Am., No. 5457, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5824, 1902.

The type is lost and the description is insufficient for final generic determination.

Habitat.—Pennsylvania?

GELECHIA SIMPLICIELLA Chambers.

Gelechia simpliciella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 238; Bull. U. S. Geol. Surv., IV, 1878, p. 147.—RILEY, Smith's List Lep. Bor. Am., No. 5483, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5825, 1902.

The type is lost and definite determination of the species impossible from the description.

Chambers says it has some resemblance to a worn specimen of *Gelechia solaniella* Chambers (*Phthorimæa glochinella*, Zeller, p. 822).

Habitat.—Kentucky.

GELECHIA SUBALBUSELLA Chambers.

Gelechia subalbusella CHAMBERS, Can. Ent., VI, 1874, p. 242.—RILEY, Smith's List Lep. Bor. Am., No. 5485.—BUSCK, Dyar's List Amer. Lep., No. 5826, 1902.

Type is lost and nothing definite can be said concerning the proper genus of the species from the description.

Habitat.—Texas.

GELECHIA SUFFUSELLA Chambers.

Gelechia suffusella CHAMBERS, Can. Ent., IV, 1872, p. 171; Bull. U. S. Geol. Surv., IV, 1878, p. 147.—RILEY, Smith's List Lep. Bor. Am., No. 5488, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5827, 1902.

The six specimens supposed to be types of the species, placed as such in the Cambridge Museum and recorded by Hagen,¹ were found on examination to be specimens of *Gelechia rufusella* Chambers (*Anacampsis fullonella*, p. 849), and thus labeled by Chambers.

No types of *suffusella* exist, and nothing can be said from the description about the generic position of that species.

Habitat.—Kentucky.

GELECHIA THORACEOCHRELLA Chambers.

Gelechia thoraceochrella CHAMBERS, Can. Ent., IV, 1872, p. 169; Bull. U. S. Geol. Surv., IV, 1878, p. 147.—RILEY, Smith's List Lep. Bor. Am., No. 5493.—BUSCK, Dyar's List Am. Lep., No. 5828, 1902.

No types are found and description is insufficient for definite generic determination.

Habitat.—Kentucky.

GELECHIA THORACESTRIGELLA Chambers.

Gelechia thoracestrigella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 245; Bull. U. S. Geol. Surv., IV, 1878, p. 147.—RILEY, Smith's List Lep. Bor. Am., No. 5496, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5829, 1902.

No types are in existence.

Chambers says about this and about the foregoing species, as well as about *thoracealbella* (p. 867), that they are very similar to *Gelechia fuscopulvella*. Probably they are all like *thoracealbella*, true *Gelechia*.

Habitat.—California.

GELECHIA UNISTRIGELLA Chambers.

Gelechia? unistrigella CHAMBERS, Can. Ent., V, 1873, p. 176.—RILEY, Smith's List Lep. Bor. Am., No. 5504, 1891.—BUSCK, Dyar's List Am. Lep., No. 5831, 1902.

Type is lost. The species can not be definitely determined generically from the description.

Habitat.—Kentucky.

¹ Papilio, IV, p. 99.

GELECHIA VERSICOLORELLA Chambers.

Depressaria versicolorella CHAMBERS, Can. Ent., IV, 1872, pp. 127, 129, 148; Bull. U. S. Geol. Surv., IV, 1872, p. 138.—RILEY, Smith's List Lep. Bor. Am., No. 5284, 1891.

Gelechia versicolorella RILEY, Smith's List Lep. Bor. Am., No. 5509, 1891.—BUSCK, Proc. U. S. Nat. Mus., XXIV, 1902, p. 732; Dyar's List Amer. Lep., No. 5832, 1902.

As shown by me, this species must be a Gelechiid, but definite determination of the genus can not be obtained from the description. Type is lost.

Habitat.—Kentucky.

GELECHIA WACOELLA Chambers.

Gelechia wacoella CHAMBERS, Can. Ent., VI, 1874, p. 237; Bull. U. S. Geol. Surv., IV, 1878, p. 148.—RILEY, Smith's List Lep. Bor. Am., No. 5511, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5833, 1902.

Type is lost and exact generic determination is impossible from the description alone.

Habitat.—Texas.

MENESTA Clemens.

Plate XXXI, fig. 30.

Menesta CLEMENS, Proc. Ent. Soc. Phila., 1860, p. 213.

Hyale CHAMBERS, Cin. Quart. Jn. Sci., II, 1875, p. 242.

The characters of this genus in accordance with Clemens's description and verified by an undoubted specimen of the type of the genus are as follows: Labial palpi smooth, slender, curved, ascending, reaching vertex; second joint slightly thickened toward apex, terminal shorter than second, smooth, slender, pointed. Forewing short, broad, tortricid-formed apical edge nearly perpendicular on costal and dorsal edge; 10 veins, veins 4 and 8 absent, all separate, 7 to apex. Hindwings over I., 7 veins, 5 absent, 3 and 4 connate, 6 and 7 stalked.

Lord Walsingham's suggestion¹ that this genus is hardly rightly separated from *Stenopta* Zeller is far from right. Neither is his conception of the venation clear. In the article just referred to in his tabulation of the supposed allied genera he writes that veins 7 and 8 in forewing are separate, and he further says² that *Menesta cinerocerina* Walsingham, the venation of which he gives, differs in venation from the genus only in having veins 6 and 7 in hindwing connate instead of stalked, thus inferring that *Menesta*, like this species, has 11 veins in forewing and 8 in hindwing, while in reality it has only 10 and 7, respectively.

Chambers suggested and Lord Walsingham established the synonymy *Menesta* Clemens-*Hyale* Chambers, about which there can not be any doubt.

¹ Insect Life, II, p. 154.

² Proc. Lond. Zool. Soc., 1895, p. 85.

The genus is an interesting one, related to *Strobisia* Clemens, and probably confined to America.

The three species at present known have all the same venation and are of great general resemblance, but easily separated by the different striking white markings.

With white costal spot.....	<i>melanella</i> , p. 903
Without costal spot.....	1
With apical cilia white.....	<i>albaciliella</i> , p. 903
Apical cilia not white.....	<i>tortriciformella</i> , p. 903

MENESTA TORTRICIFORMELLA Clemens.

Menesta tortriciformella CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 213; Stainton Ed. Tin. N. Am., 1872, p. 151.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 150.—WALSINGHAM, Proc. Zool. Soc. Lond., 1881, p. 319; Insect Life, II, 1889, p. 154.—RILEY, Smith's List Lep. Bor. Am., No. 5227, 1891.—BUSCK, Dyar's List. Am. Lep., No. 5650, 1902.

Gelechia liturella WALKER, Cat. Lep. Brit. Mus., XXIX, 1864, p. 591.

Hyale coryliella CHAMBERS, Conn. Quart. Journ. Sci., II, p. 242; Bull. U. S. Geol. Surv., IV, 1878, p. 157.

Gelechia coryliella PACKARD, Rep. U. S. Ent. Comm., V, 1890, p. 635.

Chambers' interesting life history of this species on hazel is quite similar to Miss Murtfeldt's excellent observations on the following species, *melanella* Murtfeldt, on oak, and further confirms the identity of *Hyale* and *Menesta*.

This species is probably local and is not common.

The specimen in the U. S. National Museum is from Massachusetts. Clemens' type presumably came from Pennsylvania, and Chambers described the species from Kentucky.

MENESTA MELANELLA Murtfeldt.

Menesta melanella MURTFELDT, Insect Life, II, 1890, p. 304.—RILEY, Smith's List Lep. Bor. Am., No. 5228, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5651, 1902.

This easily recognized species is well described by Miss Murtfeldt, and the interesting life history is carefully recorded with figure.

Food plant.—Oak.

Habitat.—Missouri.

A cotype and good bred series from Miss Murtfeldt are in the U. S. National Museum.

MENESTA ALBACILIÆELLA Chambers.

Strobisia albaciliæella CHAMBERS, Can. Ent., X, 1878, p. 77; Bull. U. S. Geol. Surv., IV, 1878, p. 162.—RILEY, Smith's List Lep. Bor. Am., No. 5580, 1891.

Menesta albaciliæella BUSCK, Dyar's List Amer. Lep., No. 5652, 1902.

This strikingly beautiful insect was described from a single specimen from Cincinnati. This unique type is found in easily recognizable condition in the Cambridge Museum, where I had an opportunity

to examine it. It bears Chambers' handwriting on the label, "*Strobisia albaciliella* Cham.," and it is undoubtedly authentic.

It is clearly a *Menesta*, agreeing perfectly in venation and palpi with this genus, and is very closely related to the two other species in the genus, but is at once distinguished by the white apical cilia in forewing, which contrasts beautifully with the very dark shining wing. I have only seen one other specimen of this fine species, namely, in Mr. Kearfott's collection, where is found a well-preserved specimen collected by him in New Jersey, on June 17.

STROBISIA Clemens.

Plate XXXI, fig. 31-32.

Strobisia CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 164.

This genus is well characterized by Clemens, and has the following characters:

Labial palpi perfectly smooth, curved, slender; second joint scarcely thickened, terminal joint as long as second, pointed. Forewing elongate ovate, apex obtusely pointed; 12 veins, 7 and 8 stalked, or 11 veins, 7 and 8 coincident, 2 and 3 stalked. Hindwings narrower than forewing, apex obtuse, termen slightly sinuate; 8 veins, 3 and 4 connate, 5 parallel, 6 and 7 connate. The species have dark hindwings and brilliant iridescent markings on forewings. The genus is nearly related to *Trichotaphe* Clemens.

Two species hitherto placed in this genus I have transferred to other genera, namely, *leripedella* Clemens, which belongs to *Anacampsis*, near *tristrigella* Walsingham, and will be found treated under that genus (p. 844), and *albaciliella* Chambers, which belongs to and will be found treated under *Menesta*.

The name *argenticiliella* Chambers as found in Chambers' "Index," p. 162, and in Smith's check list, No. 5581, does not appear to correspond to any description. The reference given in "Index"¹ is not correct, and the name must be dropped.

Only two described species are at present referable to this genus. They may be separated thus:

Metallic markings, narrow dashes and dots.....*irridipennella*, p. 904
Metallic markings, broad spots and bands*emblemella*, p. 905

STROBISIA IRRIDIPENNELLA Clemens.

Strobisia irridipennella CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 165; Stainton Ed. N. Am. Tin., 1872, pp. 40, 118.—CHAMBERS, Can. Ent., IV, 1872, p. 89; Bull. U. S. Geol. Surv., IV, 1878, p. 162.—FREY, Stett. Ent. Zeit., XXXIX, 1878, p. 251.—RILEY, Smith's List Lep. Bor. Am., No. 5583, 1891.—DIETZ, Smith's List Ins. New Jersey, p. 474, 1900.—BUSCK, Dyar's List Amer. Lep., No. 5653, 1902.

¹Can. Ent., X.

Strobisia aphroditeella CHAMBERS, Can. Ent., IV, 1872, p. 88.—FREY, Stett. Ent. Zeit., XXXIX, 1878, p. 251.

Strobisia proserpinella FREY, Stett. Ent. Zeit., XXXIX, 1878, p. 251.—RILEY, Smith's List Lep. Bor. Am., No. 5585, 1891.

This species is the type of the genus and the more specialized of the two species. It has veins 7 and 8 in the forewings coincident.

Chambers is himself responsible for placing his *aphroditeella* as a synonym of *irridipennella*, which the description indicates is the case. He committed, however, a clerical mistake in doing it. He wrote:¹

Strobisia venustella I am now satisfied is a synonym of *S. irridipennella* Clemens. Because of the presence of several brilliant blue spots on the wings of my specimens not mentioned in Dr. Clemens' description, I was led to believe that they belonged to a different species. But the individuals vary in this respect.

There can be no question but that *venustella* is a mistake for *aphroditeella*, the description of which only can be applied to *irridipennella*. This is also demonstrated by Chambers afterwards in his "Index,"² where he placed his species right, *aphroditeella* as synonym of *irridipennella* and *venustella* as synonym of the following species, *emblemella* Clemens.

On account of the same defects in Clemens' description, which misled Chambers, Frey described his *proserpinella*, which undoubtedly is the same as *irridipennella*, the description agreeing in every particular.

Although this species is very abundant in the vicinity of Washington, and though I have given special attention to it for some years, its larval history is as yet entirely unknown, and furnishes a worthy subject for study for any student who has an opportunity to work it out. The larva will, I believe, be found to be a stem borer.

STROBISIA EMBLEMELLA Clemens.

Strobisia emblemella CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 164; Stainton Ed. N. Am. Tin., 1872, pp. 40, 118.—CHAMBERS, Can. Ent., IV, 1872, pp. 89, 90; Bull. U. S. Geol. Surv., IV, 1878, p. 162.—FREY, Stett. Ent. Zeitung, XXXIX, 1878, p. 251.—RILEY, Smith's List Lep. Bor. Am., No. 5583, 1891.—DIETZ, Smith's List Ins. N. J., 1900, p. 474.—BUSCK, Dyar's List Amer. Lep., No. 5654, 1902.

Strobisia venustella CHAMBERS, Can. Ent., IV., 1872, p. 90.

This well-described species differs generically from the type only by having vein 8 in forewings present, out of vein 7. A specimen determined by Lord Walsingham and by the writer are in the U. S. National Museum.

It is not nearly as common in the localities around Washington as the preceding species.

¹ Can. Ent., VI, p. 7.

² U. S. Geol. Surv. Bull., IV, p. 162.

TRICHOTAPHE Clemens.

Plate XXXII, fig. 33.

Trichotaphe CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 166.*Begoë* CHAMBERS, Can. Ent., IV, 1872, p. 24.*Epicorthylis* ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 248.*Malacotricha* ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 282.

Begoë Chambers is the same as *Malacotricha* Zeller, erected on the same species.

I have before me authentic specimens of the types and of all American species hitherto included in these three genera, besides several other described and undescribed species belonging to this group.

After examining them very carefully, and after comparing critically the descriptions and figures given by the authors, it is my opinion that these three genera are artificial divisions of one natural group, and that they should not be retained.

All three genera have exactly the same venation, wing form, and general habitus, and differ only in the slight modification of the hairs on second joint of the labial palpi, *Trichotaphe* being supposed to include the forms with perfectly smooth though thickened palpi; *Begoë* (*Malacotricha*) those where the hairs on the upper (inner) side of second joint are somewhat longer and looser, and *Epicorthylis* representing those where these hairs are still more developed.

However, these differences pass so gradually into each other that in most cases a species can be equally well placed in two of the genera, and species which are evidently very close otherwise will be found to differ in respect to these hairs, while others, clearly farther apart, will be found to agree in the form of the palpi.

In his characterization of *Trichotaphe* Clemens was aware of these modifications of the labial palpi, but rightfully gave them only specific value.

Zeller himself also conceded this¹ and wrote:

Wahrscheinlich haben die *Malacotrichen* gleichen Aderverlauf [as *Trichotaphe* (A. B.)]. Die kleine Verschiedenheit in der Behaarung der Taster zwischen *Malacotriche* und *Trichotaphe* hat Clemens sicher mit Recht nicht als Gattungsmerkmal betrachtet.

And anyone who will compare Zeller's figures of *Epicorthylis* and *Malacotriche*² and who knows that the venation and other characters are identical in the two forms will be apt to concede that the two genera are not separable.

The genus *Trichotaphe* as here used, including all these closely related forms is near *Ypsolophus*, and some of the species approach this genus markedly in the form of the palpi as well as in coloration.

¹ Verh. k. k. zool.-bot. Gesell. Wien, XXIII, p. 279.

² Pl. III, fig. 13 a. b. and fig. 28 a. b.

Striking instances of this are *Trichotaphe setosella* Clemens compared with *Ypsolophus eupatoriella* Chambers and *Trichotaphe serrativittella* Zeller compared with *Ypsolophus ligulellus* Hübner.

On the other hand *Trichotaphe* comes very close to *Anacamptis* Curtis, differing only in the somewhat shorter palpi and in having veins 2 and 3 in forewing stalked.

The genus has the following characters: Antennæ serrate, often more or less ciliated. Labial palpi long, recurved, second joint thickened with scales, appressed and smooth in front and laterally, smooth or more or less long-haired above (on the inside); terminal joint long, but shorter than second joint, slender, smooth, pointed. Forewings elongate, apex obtuse, 12 veins, 7 and 8 stalked, 2 and 3 stalked. Hindwings broader than forewings, slightly sinuate below apex, trapezoidal, and angle rounded; 8 veins, 3 and 4 connate with a tendency to become short-stalked, 5 approximate to 4, 6 and 7 connate with a tendency to become short-stalked. Discal vein in several species with a tendency to become obsolete.

Depressaria georgiella Walker, which Lord Walsingham placed in this genus, is unknown to me except from the description, but this, if correct, clearly shows that the species can not be a *Trichotaphe*.

However, as I do not know the species, it must for the present remain in *Trichotaphe*, as Walsingham has placed it, but it is not included in the synoptic table, by which the species at present recognized may be separated.

Ground color of forewings dark, nearly black.....	1
Ground color lighter, fuscous brown or yellow.....	9
1. Forewings with light costal edge.....	2
Costal edge not light.....	5
2. Head and costa reddish brown.....	<i>costarufella</i> , p. 909
Head and costa light ochereous.....	3
3. Costal light area with curved pointed process into the dark dorsal area.....	<i>flavocostella</i> , p. 908
Costal light area without such process.....	4
4. Dorsal dark area with single rounded process into the costal light area.....	<i>inserrata</i> , p. 908
Dorsal dark area with two small sharp processes into the costal light area.....	<i>serrativittella</i> , p. 909
5. Forewings with strong metallic reflections.....	6
Forewings without such reflections.....	8
6. With light ochereous costal spot at apical third.....	<i>alacella</i> , p. 909
Without such ochereous spot.....	7
7. With small whitish dot at end of cell.....	<i>purpureofusca</i> , p. 910
Without such dot.....	<i>nonsteigella</i> , p. 910
8. Labial palpi light ochereous.....	<i>juncidella</i> , p. 910
Labial palpi dark.....	<i>melantherella</i> , p. 911
9. Ground color of forewings light ochreous with no transverse markings.....	10
Ground color gray, brown or fuscous with transverse markings.....	14
10. Forewings overlaid with dark scales.....	<i>chambersella</i> , p. 913
Forewings at most sprinkled with dark scales.....	11

11. With dark spot on fold.....	12
Without such spot.....	13
12. Forewings ocherous.....	<i>trimaculella</i> , p. 914
Forewings yellowish white.....	<i>lactiflosella</i> , p. 914
13. Head whitish.....	<i>fernaldella</i> , p. 915
Head ocherous.....	<i>bidiscomaculella</i> , p. 914
14. Costal edge ocherous.....	<i>setosella</i> , p. 911
Costal edge not ocherous.....	15
15. Head and thorax brown.....	<i>condaliavorella</i> , p. 913
Head and thorax whitish fuscous.....	<i>inversella</i> , p. 912
Not included in table.....	<i>georgicella</i> , p. 916

TRICHOTAPHE FLAVOCOSTELLA Clemens.

Gelechia ? *flavocostella* CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 162; Stainton Ed. N. Am. Tin., 1872, p. 113.

Trichotaphe flavocostella CLEMENS, Proc. Ent. Soc. Phila., I, 1862, p. 131; Stainton Ed. N. Am. Tin., 1872, p. 180.—BUSCK, Dyar's List Amer. Lep., No. 5655, 1902.

Gelechia (*Trichotaphe*) *flavocostella* ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, pl. iv, fig. 26, 1873, p. 279.

Gelechia flavocostella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 143.—COQUILLETT, Rep. State Ent. Nox. Ben. Ins. Ill., X, 1881, p. 153.

Gelechia flavicostella WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 184.—RILEY, Smith's List Lep. N. Am. No. 5362, 1891.

Trichotaphe flavicostella DIETZ, Smith's List Ins. N. Jersey, 1900, p. 475.

This strikingly marked species is quite commonly taken at light in the vicinity of Washington City. It was described by Zeller from Massachusetts, while Clemens' specimen came from Maine. In the National Museum are specimens from Illinois, Iowa, New York, Missouri, District of Columbia, and Georgia.

Mr. Coquillett recorded the food plant as sunflower (*Helianthus*). It has been bred by Miss Murtfeldt and in the insectary of the Department of Agriculture from *Solidago*, from which plant I have also bred it, I am sorry to say without sufficiently careful notes to be able to give the differences between the larvæ of this and of the following species, *inserrata* Walsingham, which are quite similar. I have even a suspicion that the two species may prove to be varieties of one species.

TRICHOTAPHE INSERRATA Walsingham.

Gelechia (*Trichotaphe*) *inserrata* WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 184.

Gelechia inserrata RILEY, Smith's List Lep. Bor. Am., No. 5391, 1891.

Trichotaphe inserrata BUSCK, Dyar's List Amer. Lep., No. 5656, 1902.

This species has been bred by Miss Murtfeldt and myself from *Solidago*, and is commonly found in company with the foregoing species among these plants.

The type is in Professor Fernald's collection, where I have compared it with specimen from U. S. National Museum.

The species comes to light freely.

TRICHOTAPHE SERRATIVITTELLA Zeller.

Gelechia (Trichotaphe) serrativittella ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 280, pl. iv, fig. 27.

Gelechia serrativittella CHAMBERS, Can. Ent., IX, 1877, p. 24; Bull. U. S. Geol. Surv., IV, 1878, p. 147.—WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 184.—RILEY, Smith's List Lep. Bor. Am., No. 5480, 1891.

Gelechia plutella CHAMBERS, Can. Ent., VI, 1874, p. 238; Bull. U. S. Geol. Surv., IV, 1878, p. 146.—RILEY, Smith's List Lep. Bor. Am., No. 5449, 1891.

Trichotaphe serrativittella BUSCK, Dyar's List Amer. Lep., No. 5657, 1902.

Zeller's type is in Cambridge. The type of *Gelechia plutella* Chambers is presumably lost, but there seems no reason to doubt this apparent synonymy, which Chambers himself suggested.

In the U. S. National Museum are specimens from Kansas (Creve-cœur), and several specimens taken at light in the vicinity of Washington City by the writer.

TRICHOTAPHE COSTARUFOELLA Chambers.

Gelechia costarufuella CHAMBERS, Can. Ent., VI, 1874, p. 240.

Gelechia costarufuella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 142.—RILEY, Smith's List Lep. Bor. Am., No. 5345, 1891.

Trichotaphe costarufuella BUSCK, Dyar's List Amer. Lep., No. 5658, 1902.

The description of this species suggests that it is a *Trichotaphe*, and this was verified by examining types in Professor Fernald's collection and in the Museum of Comparative Zoology in Cambridge, all in miserable condition, but bearing Chambers' labels and undoubtedly representing this species, which is easily recognized by Chambers' description.

One specimen of this species is in the U. S. National Museum, which Lord Walsingham by mistake has labeled *Trichotaphe setosella*? It has no locality label.

Chambers' types are from Texas.

TRICHOTAPHE ALACELLA Clemens.

Trichotaphe alacella CLEMENS, Proc. Ent. Soc. Phila., 1860, p. 132; Stainton Ed. N. Am. Tin., 1872, p. 180.—DIETZ, Smith's List Ins. N. Jersey, 1900, p. 474.—BUSCK, Dyar's List Amer. Lep., No. 5659, 1902.

Gelechia alacella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5302, 1891.

Gelechia (Trichotaphe) ochripalpella ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 279.—WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 183.

Gelechia ochripalpella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 145.

Gelechia goodella CHAMBERS, Journ. Cinn. Soc. Nat. Hist., III, 1881, p. 289.

Zeller changes the name of this species because of the preoccupation of *alacella*, but this contention will not hold on account of *Acanthophilata alacella* Dupont, and the present species should be known under Clemens' original name.

I have examined Chambers' type of *Gelechia gooddella* in Professor Fernald's collection, which Lord Walsingham had before him in 1882. It is undoubtedly the same as Clemens' species, the type of which is lost. Chambers' type came from Massachusetts, Clemens' type presumably from Pennsylvania; Zeller's specimens were from Washington City.

In the U. S. National Museum are specimens from all these localities and from New York.

TRICHOTAPHE PURPUREOFUSCA Walsingham.

Gelechia (Trichotaphe) purpureofusca WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 184.

Gelechia purpureofusca RILEY, Smith's List Lep. Bor. Am., No. 5458, 1891.

Trichotaphe purpureofusca BUSCK, Dyar's List Amer. Lep., No. 5660, 1902.

This splendid insect I have easily identified among the unnamed material in the U. S. National Museum. I have later examined the type in Professor Fernald's collection.

It is our largest described species of this genus. The large orange-yellow palpi contrast strikingly with the dark purplish shining forewings.

Food plant is not known.

TRICHOTAPHE NONSTRIGELLA Chambers.

Dasycera nonstrigella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, pp. 92, 138.—

RILEY, Smith's List Lep. Bor. Am., No. 5546.

Trichotaphe nonstrigella BUSCK, Dyar's List Amer. Lep., No. 5661, 1902.

This species was described from a single female specimen, collected in Kentucky, "resting on a leaf in the woods June 30."

This unique type is found in the Museum of Comparative Zoology in Cambridge, in easily recognizable condition, agreeing minutely with Chambers' description and bearing his label.

It was somewhat of a surprise to find it to be a Gelechiid with wing-form, venation, and palpi agreeing exactly with the present genus.

The densely ciliated antennæ which Chambers describes surely are remarkable. Ciliate and serrate antennæ are found in all the species of *Trichotaphe*, but in this species they are unusually developed.

Still, there is no doubt that the species rightfully belongs to the present genus and quite near the foregoing species.

In the U. S. National Museum is a single specimen from Kansas (Crevecoeur), and I have examined one other specimen collected near Chambers' locality by Miss Annette Braun of Cincinnati, Ohio.

TRICHOTAPHE JUNCIDELLA Clemens.

Trichotaphe juncidella CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 166;

Stainton Ed. N. Am. Tin., 1872, p. 122.—BUSCK, Dyar's List Amer. Lep., No. 5662, 1902.

Gelechia juncidella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 144.

Gelechia (*Trichotaphe*) *juncidella* WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 183.

Gelechia pallipalpis WALKER, Cat. Lep. Het. Brit. Mus., XXIX, 1864, p. 596.

Depressaria? *dubitella* CHAMBERS, Can. Ent., IV, 1872, pp. 90, 91, 92, 128.

Gelechia dubitella CHAMBERS, Can. Ent., IV, 1872, p. 147; Bull. U. S. Geol. Surv., IV, 1878, p. 116.

Gelechia (*Cryptolechia*) *dubitella* CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 143.

Depressaria (*Gelechia*) *dubitella* MURTFELDT, Can. Ent., VI, 1874, p. 221.

Gelechia hallipalpis RILEY, Smith's List Lep. Bor. Am., No. 5394, 1891.

Lord Walsingham is responsible for the synonymy which seems probable from the descriptions. What caused Riley to give Walker's name [misspelled] precedence in his list I do not know, but the species ought to be known as *juncidella* Clemens, as shown by Lord Walsingham.

It is one of the most common Gelechiidae in the vicinity of Washington. Miss Murtfeldt has recorded its food plant as *Ambrosia artemisiifolia*; I have reared large series from this plant, and also from *A. tripida*, and from *Solidago* and *Aster*. The larva, which is well described by Miss Murtfeldt, folds the edge of the leaf and pupates within the fold. There are at least two generations in the locality of Washington City.

Chambers described his species from Kentucky; Miss Murtfeldt's specimen came from Missouri, and Clemens' specimen presumably from Pennsylvania. In the National Museum are specimens from the following localities: Canada, Kansas, Maine, District of Columbia, Virginia, Maryland, Maine.

TRICHOTAPHE MELANTHERELLA Busck.

Trichotaphe melantherella BUSCK, Proc. U. S. Nat. Mus., XXIII, 1900, p. 232, pl. 1, fig. 2; Dyar's List Amer. Lep., No. 5663, 1902.—DYAR, Proc. Ent. Soc. Wash., IV, 1901, p. 472.

Type.—No. 4939, U.S.N.M.

Food plant.—*Melanthera deltoidea*.

Habitat.—Palm Beach, Florida.

TRICHOTAPHE SETOSELLA Clemens.

Trichotaphe setosella CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 166; Stainton Ed. N. Am. Tin., 1872, p. 121.—ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 282.—BUSCK, Dyar's List Amer. Lep., No. 5664, 1902.

Gelechia setosella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 147.

Begoe costolutella CHAMBERS, Can. Ent., IV, 1872, p. 209; Can. Ent., IX, 1877, p. 24.

Gelechia (*Malacotricha*) *bilobella* ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 280, pl. IV, fig. 28, a, b.—WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 185.

Gelechia bilobella RILEY, Smith's List Lep. Bor. Am., No. 5325, 1891.

The great similarity in coloration and size between the two species, *Trichotaphe setosella* Clemens = *Begoe costolutella* Chambers = *Malaco-*

triche bilobella Zeller, and *Ypsolophus* (*Nothris*) *eupatoriella* Chambers = *Nothris dolabella* Zeller has very naturally caused some trouble.

A large series of both species is before me. The *Ypsolophus* species I have bred from *Eupatorium* in Washington City, and there can be no doubt but that it represents *eupatoriella* Chambers, nor that this is synonymous with Zeller's *dolabella*, as thought by Lord Walsingham; but I can not agree with his Lordship in placing *setosella* Clemens as synonymous with this species.

Clemens was well acquainted with the genus *Ypsolophus*, and would undoubtedly have placed his species in that genus had it belonged there. His description fits the *Trichotaphe* species better than the other species, and even if there was a doubt it seems reasonable to give Dr. Clemens the benefit thereof, and not remove his species from the genus which he himself had erected and surely should be supposed to know.

Lord Walsingham was led to his conclusions through a specimen labeled *setosella* in C. T. Robinson's collection, but it seems much more natural to suppose that this specimen was wrongly labeled—taking in consideration the great similarity of the two species—than to suppose that Dr. Clemens should not have known an *Ypsolophus* when he saw one, but should have described it wrongly under another—and his own—genus.

Clemens' type is no longer in existence, so absolute proof can not be obtained; but the circumstantial evidence speaks for Zeller's view, that *setosella* is a *Trichotaphe* [*Malachotriche*], as originally described by Clemens.

Habitat.—District of Columbia, Ohio (Zeller), Kentucky (Chambers), Pennsylvania (Clemens). In the U. S. National Museum are specimens from New York and Texas.

TRICHOTAPHE INVERSELLA Zeller.

Epicorthydis inversella ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 248, pl. III, fig. 13, a, b.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 140; Can. Ent., X, 1878, p. 54; Journ. Cinn. Soc. Nat. Hist., II, 1880, pp. 198, 202, fig. 13.—RILEY, Smith's List Lep. Bor. Am., No. 5559, 1891.

Trichotaphe inversella BUSCK, Dyar's List Amer. Lep., No. 5665, 1902.

I have examined specimens determined by Chambers in the U. S. National Museum and in Professor Fernald's collection; also several other specimens in the National Museum, and in Dr. Dietz's collection, all agreeing with Zeller's type in the Museum of Comparative Zoology, in Cambridge, and with his description and figure.

The difference in labial palpi is only a difference in degree, not in kind, and the species can well be included in *Trichotaphe* on that account.

Zeller writes that veins 7 and 8 in forewing "die Flügelspitze umfasst;" but the apex in this species, as in most of the species belong-

ing to *Trichotaphe*, is not pointed, but rounded. It is a matter of taste where the extreme point is, and it can just as well be said that veins 7 and 8 go to costa, as is characteristic for the entire family *Gelechiidae*.

Chambers' figure of the venation of this species¹ is wrong in several points besides the one in hindwing, corrected by Chambers in the margin of H. Edwards' copy and recorded by Mr. William Bentenmüller.² The form of the wing is not correct, the stalk of veins 2 and 3 in forewings is longer than represented in the figure and vein 8 is omitted.

All the specimens I have met with came from Texas.

TRICHOTAPHE CONDALIAVORELLA Busck.

Trichotaphe condaliavorella Busck, Proc. U. S. Nat. Mus., XXIII, 1900, p. 232; Dyar's List Amer. Lep., No. 5666, 1902.—DYAR, Proc. Ent. Soc. Wash., IV, 1901, p. 473.

Type.—No. 4940, U.S.N.M.

Food plant.—*Condalia ferrea*.

Habitat.—Palm Beach, Florida.

TRICHOTAPHE CHAMBERSELLA Murtfeldt.

Gelechia chambersella MURTFELDT, Can. Ent., VI, 1874, p. 222; Can. Ent., XIII, 1881, p. 242.—CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 240; Bull. U. S. Geol. Surv., IV, 1878, pp. 116, 142.—RILEY, Smith's List Lep. Bor. Am., No. 5336, 1891.

Gelechia inaequepulvella CHAMBERS, Cinn. Quart. Journ. Sci., II, 1875, p. 239; Bull. U. S. Geol. Surv., IV, 1878, p. 144.—RILEY, Smith's List Lep. Bor. Am., No. 5388, 1891.

Trichotaphe chambersella Busck, Dyar's List Amer. Lep., No. 5667, 1902.

There may be some question as to the right of giving Miss Murtfeldt's name priority; but inasmuch as she certainly had her name in print (though without description of the species) and inasmuch as her biological note on the food plant given at that time really is of quite as much value in recognizing the species as Chambers' mere excuse for a description, I give her name preference, the more so because it surely was Chambers' inexcusable fault that a synonym was made, and because only through Miss Murtfeldt has the species and its synonymy been finally cleared up.

It appears from correspondence I have had with Miss Murtfeldt that she sent the first specimen bred by her to Chambers for determination; that he pronounced it a new species and agreed that Miss Murtfeldt should name it after him; that he thereafter, on the single specimen received from Miss Murtfeldt, made a new species, *inaequepulvella*, forgetting or mistaking the identity of the specimen in such a degree that he, on the very next page, mentions having received such a specimen and compares it with his *ambrosiavella*.

This single original type specimen is still found in Cambridge in

¹Journ. Cinn. Soc. Nat. Hist., II, p. 202, fig. 13.

²Ent. Am., V, p. 37.

poor but recognizable condition, labeled by Chambers *inaequipulvella*, and proving beyond a doubt that it really is Miss Murtfeldt's species.

In Amherst, in Professor Fernald's collection, I have examined Miss Murtfeldt's type, and I have also received identical authenticated specimens from Miss Murtfeldt.

In the U. S. National Museum are, besides these, two identical specimens bred by Mr. Coquillett in Los Angeles, California, from the same food plant as Miss Murtfeldt recorded, *Ambrosia artimisiifolia*. Mr. Coquillett has kindly given me his notes on the larva, which are identical with Miss Murtfeldt's careful description. I have also bred the species from same food-plant in Washington and in Kentucky.

TRICHOTAPHE LACTIFLOSELLA Chambers.

Gelechia lactiflosella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, pp. 89, 144.—

RILEY, Smith's List Lep. Bor. Am., No. 5398, 1891.

Trichotaphe lactiflosella BUSCK, Dyar's List Amer. Lep., No. 5668, 1902.

The unique type of this easily recognized, large, light-yellow species was found in the Museum of Comparative Zoology in Cambridge, in good condition, authenticated by Chambers' label and agreeing with his description.

I have taken several specimens of this species this summer at light on Plummers Island in the Potomac River, Maryland.

The type is from Texas.

TRICHOTAPHE TRIMACULELLA Chambers.

Gelechia trimaculella CHAMBERS, Can. Ent., VI, 1874, p. 238; Bull. U. S. Geol.

Surv., IV, 1878, p. 147.—RILEY, Smith's List Lep. Bor. Am., No. 5500, 1891.

Trichotaphe trimaculella BUSCK, Dyar's List Amer. Lep., No. 5669, 1902.

Chambers' type from Miss Murtfeldt's collection, now in Professor Fernald's possession, agrees with his types in Cambridge and with his description.

It is an easily recognized species, of which I have found examples in the unnamed material in the U. S. National Museum.

It is a typical *Trichotaphe* and has a similar very striking counterpart in *Ypsolophus touceyellus* Busck (*Anarsia trimaculella* Chambers) (p. 922), as *Trichotaphe setosella* has in *Ypsolophus eupatoriella* (p. 925).

This recurring specific similarity between species of the two genera is an interesting proof of their near relationship. The species was described from Kentucky; the specimen in the U. S. National Museum came from Texas. I have also taken it at light in District of Columbia.

TRICHOTAPHE BIDISCOMACULELLA Chambers.

Gelechia bidiscomaculella CHAMBERS, Can. Ent., VI, 1874, p. 241; Bull. U. S.

Geol. Surv., IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5324, 1891.

Trichotaphe bidiscomaculella BUSCK, Dyar's List Amer. Lep., No. 5670, 1902.

Chambers described his *Gelechia bidiscomaculella* from a single specimen, with palpi missing, collected in Texas. This type specimen is no longer in existence, and absolute certainty concerning the species is therefore not obtainable.

Chambers says that it is "perhaps a variety of *subrubrella* Chambers," described on the same page, which species, he again writes, is "perhaps a variety of *rufusella* Chambers," and which I, after careful consideration of all the material of *rufusella* [= *Anacampsis fullonella* Zeller, p. 849], had placed as synonym of that species.

It is evident that *bidiscomaculella* must be very similar to this species.

In Professor Fernald's collection is what was supposed to be a type of *Gelechia rufusella*, with label to that effect in Chambers' handwriting. This specimen is from Texas, wherefrom both the above species were described, and it is very similar specifically to *rufusella* (*Anacampsis fullonella*), but belongs to the genus *Trichotaphe*, and could not be *rufusella*, because Chambers expressly emphasizes that this species has the terminal joint of labial palpi longer than second joint, as have also the other types of *rufusella*, while the specimen in Professor Fernald's collection has the terminal joint decidedly shorter than second.

It agrees with Chambers' short description of *Gelechia bidiscomaculella*, and, aside from the difference in the length of labial palpi, differs from *rufusella* in having underside of thorax and legs black, with narrow white annulations on the tarsi. Second joint of palpi is also deep black on the underside except at apex.

I believe this specimen represents *Gelechia bidiscomaculella*, and have consequently referred that species to the present genus.

I know of no other specimens of this species.

TRICHOTAPHE FERNALDELLA, new species.

Trichotaphe fernaldella Busck, Dyar's List Amer. Lep., No. 5671, 1902.

Antennæ dark fuscous with narrow yellow annulations; cilia less than I. Labial palpi long, perfectly smooth, light straw yellow; second joint thickened with appressed scales, terminal joint nearly as long as second. Face, head, and thorax light straw yellow. Forewings more pointed than usual in the genus, light straw yellow with the intervals between the veins slightly deeper colored.

One dark fuscous round dot is on the middle of the cell, another similar one at the end of the cell. Around the apical edge is a thin dark line, and just inside this along the edge of the wing is a row of small dark fuscous dots. Cilia whitish yellow with two indistinct yellowish fuscous lines parallel with the edge of the wing. Hindwings very light whitish straw colored, the edge darker; cilia white.

Abdomen yellowish white. Legs light straw colored without any markings.

Alar expanse.—18 mm.

Habitat.—Orono, Maine.

Type.—No. 6393, U.S.N.M.

Other specimens in Professor Fernald's collection.

The species has a certain general resemblance to *Gelechia petasitis* Pfaffenzeller, with which species it had been confounded in Professor Fernald's collection.

I am glad to name this very distinct species after Professor Fernald, to whom the U. S. National Museum is indebted for the type and to whom the writer is under many obligations for much valuable help kindly extended during these studies.

TRICHOTAPHE? GEORGIELLA Walker.

Depressaria georgiella WALKER, Cat. Lep. Het. Brit. Mus., XXXV, 1866, p. 1827.

Trichotaphe georgiella WALSINGHAM, Proc. Zool. Soc. Lond., 1891, p. 312.—BUSCK,

Proc. U. S. Nat. Mus., XXIV, 1902, p. 731; Dyar's List Amer. Lep., No. 5672, 1902.

Walker says in his description of this species:

Second joint of labial palpi with a long tuft at the tip beneath, third joint much longer than second.

Which clearly shows that it can not be a *Trichotaphe*, as suggested by Lord Walsingham; but as I have not recognized the species, type of which is in Lord Walsingham's possession, it must for the present remain in this genus, as he has placed it.

GLYPHIDOCERA Walsingham.

Plate XXXII, fig. 34.

Glyphidocera WALSINGHAM, Proc. Zool. Soc. Lond., 1891, p. 531, pl. XLI, fig. 8.

Antennæ slightly serrate and in the males deeply notched on the upper side of the joint next to the basal one; in the females simple, without notch, but the outer end of the basal joint is somewhat enlarged. Maxillary palpi obsolete. Labial palpi long, recurved, smooth, somewhat compressed laterally, sharpened in front; terminal joint pointed, shorter than second joint. Forewing elongate, rounded at apex, slightly arched at extreme base of costa, costal and dorsal edge parallel; 11 veins, vein 8 absent, 7 to costa, 2 and 3 stalked. Hindwings twice as broad as forewings, termen slightly sinuate, 8 veins, 3 and 4 stalked, 6 and 7 stalked.

The notched antennæ in the male are exceptional in the family Gelechiidae, and found only in this and in the following genus; they are exactly similar to the antennæ found in some of the Blastobasidae.

Lord Walsingham placed this genus in Xyloryetidae, but it falls naturally in the present family.

The two recognized American species of this genus may easily be

separated by the characters given below. I have met with two other species of this genus, but have not sufficient good material to describe them.

With face, head, and thorax dark fuscous *floridanella*, p. 917.
 With face, head, and thorax light ochreous..... *æquepulvella*, p. 917.

GLYPHIDOCERA FLORIDANELLA Busck.

Glyphidocera floridanella Busck, Proc. Ent. Soc. Washington, IV, 1901, p. 474;
 Dyar's List Amer. Lep., No. 5673, 1902.

Type.—No. 5663, U.S.N.M.

Habitat.—Palm Beach, Florida.

GLYPHIDOCERA ÆQUEPULVELLA Chambers.

Gelechia æquepulvella CHAMBERS, Can. Ent., IV, 1872, p. 192; Can. Ent., VI, 1874, p. 230; Cinn. Quart. Journ., II, 1875, p. 246; Bull. U. S. Geol. Surv., III, 1877, pp. 125, 141; IV, 1878, p. 141.—RILEY, Smith's List Lep. Bor. Am., No. 5300, 1891.

Glyphidocera æquepulvella BUSCK, Proc. Ent. Soc. Wash., IV, 1901, p. 475; Dyar's List Amer. Lep., No. 5674, 1902.

In the Museum of Comparative Zoology in Cambridge was found 11 specimens labeled by Chambers *Gelechia æquepulvella* and agreeing with his description.

They unquestionably represent this species and show that it belongs to the present interesting genus.

I have met with only one other specimen in U. S. National Museum, from Texas, probably received from Chambers, who also recorded the species from Kentucky, Colorado, and California.

ANORTHOSIA Clemens.

Plate XXXII, fig. 35.

Anorthosia CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 156.

Sagaritis CHAMBERS, Can. Ent., IV, 1872, p. 225.

Antennæ in male with deep notch above near base like in the preceding genus; in female simple, without the notch. Labial palpi with second joint clothed beneath with porrected appressed long stiff hairs, above with large expansible tuft of hairs; terminal joint erect, slender, pointed. Forewings elongate, narrow, pointed; 12 veins, 7 and 8 stalked to costa, 2 and 3 stalked. Hindwings narrower than forewings, pointed, termen sinuate below apex; 8 veins, 3 and 4 connate, 5 approximate to 4, 6 and 7 connate, transverse vein nearly obsolete between 5 and 6.

Clemens says in his description and shows in his figure that terminal joint of labial palpi is emitted from apical third of second joint, while it in reality is emitted from the end of second joint proper, as denuding shows, and only look otherwise on account of the protruding hairs on the underside.

Strangely enough neither Clemens nor Lord Walsingham observed the striking antennal structure in the male; Clemens' figure of the antennae is that of the female.

Lord Walsingham writes¹ that veins 3 and 4 in hindwing are separate in *Anorthosia*. This is a mistake and in variance with Clemens' description and figure as well as with specimens of *Anorthosia punctipennella*, undoubtedly correctly determined by Lord Walsingham in the collections of U. S. National Museum, Dr. Dietz, Professor Fernald, and in the Philadelphia Academy of Natural Sciences, bearing Walsingham's blue labels No. 319, 327, and others.

And if *Anorthosia straminis* Walsingham, described from Africa, has the alleged venation it can not properly be included in this genus.

Of Chambers' genus *Sagaritis* no authentic material exists, but his description leads me to believe that it must be identical with *Anorthosia*, though several minor details of his figure of the venation differ from the true venation of *Anorthosia*; but nearly all of Chambers' delineations are more or less incorrect and can not be depended upon.

I am so fortunate as to have my opinion corroborated by Lord Walsingham, who independently concluded that *Sagaritis* was synonymous with *Anorthosia*, but still this question will be open to doubt until we know the American fauna much more intimately than we do now.

Only the two species are included, and I feel rather confident that Chambers' species is even specifically identical with *Anorthosia punctipennella*, and can not, from his short description, choose any differences from that species which may not be omissions caused by an imperfect specimen used as type; but at present I think it more proper and safe to retain *gracilella* as a distinct species until further knowledge of our fauna is obtained.

ANORTHOSIA PUNCTIPENNELLA Clemens.

Anorthosia punctipennella CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 15; Stainton Ed. N. Am. Tin., 1872, p. iii.—CHAMBERS, Can. Ent., IV, 1872, p. 225; VI, 1874, p. 245.—WALSINGHAM, Trans. Ent. Soc. Lond., 1891, p. 110.—RILEY, Smith's List Lep. Bor. Am., No. 5522, 1891.—BUSCK, Dyar's List, Amer. Lep., No. 5675, 1902.

Clemens's type is lost, but there is no difficulty in identifying this peculiar species. I have examined many specimens determined by Lord Walsingham, who had seen Clemens' original specimen, and I have repeatedly taken this species in the vicinity of Washington.

The highly specialized palpi give the insect a peculiar bearded appearance when it is excited and spreads the long hairs out laterally on each side of the face. The early stages are not known.

Habitat.—Eastern United States.

¹ Trans. Ent. Soc. Lond., 1891, p. 110.

ANORTHOSIA GRACILELLA Chambers.

Sagaritis gracilella CHAMBERS, Can. Ent., IV, 1874, p. 226; Bull. U. S. Geol. Surv., IV, 1878, p. 162.—RILEY, Smith's List Lep. Bor. Am., No. 5544, 1891.
Anorthosia gracilella, BUSCK, Dyar's List Amer. Lep., No. 5676, 1902.

The species is unknown to me if it does not eventually prove the same as the foregoing, when it is found that the description can not be applied to any other Gelechiid.

Habitat.—Kentucky.

ENCHRYSA Zeller.

Enchrysa ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 282.

I am not personally acquainted with this genus except from Zeller's description and figure and from the following notes kindly sent me by Mr. J. Hartley Durrant on the unique type in Lord Walsingham's collection.

As Zeller's generic description and figure certainly must be incorrect, I have relied exclusively on the notes on the type, which are as follows:

Type minus abdomen and one hindwing and the whole insect rickety. I found this very difficult to study, fearing it would fall to pieces at the least jar. It is a very distinct thing; you will know it at once if you see a specimen. Antennae dentate, palpi smooth, terminal joint distinctly shorter than median. Forewings impressed on costa toward apex; 12 veins, 7 and 8 stalked, 7 to immediately above apex, 3 from before angle of cell. Hindwings elongate, widening outward; apex pointed, produced; termen excavate beneath apex, slightly emarginate above tornus; 8 veins, 3, 4, and 5 remote, nearly parallel, 7 and 8 remote. Very close to *Aristotelia*, from which I think it is perhaps separable, but I have had great difficulty in studying the type. Zeller's figure satisfactory so far as it goes. I dare not trust this specimen to the post; it would certainly fall all to pieces.

I have placed this genus, following Zeller, next to *Ypsolophus*, but it does seem evident that it is much nearer *Aristotelia*, as Mr. Durrant writes.

Only the one species has been described.

ENCHRYSA DISSECTELLA Zeller.

Enchrysa dissectella ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 283, pl. IV, fig. 29ab.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 140.—RILEY, Smith's List Lep. Bor. Am., No. 5593, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5677, 1902.

The unique type is in the Walsingham's collection. It was described from Ohio.

No other specimen has been recognized, but it must be a striking little animal, and should be recognized from Zeller's figure and description without any difficulty.

YPSOLOPHUS Fabricius.

Ypsolophus FABRICIUS, Supplementum Ent. Syst., Hafniae, 1798, p. 421, pl. xxxvi.

Labial palpi long curved, second joint thickened, with dense projecting tuft of long hairs beneath, sometimes rough above; terminal as long or longer than second, slender pointed.

Forewings with 12 veins, 7 and 8 stalked, 2 and 3 stalked; hindwings as broad or broader than forewings, trapezoidal apex obtusely pointed, termen slightly sinuate; 8 veins, 3 and 4 connate or stalked, 5 approximate to 4, 6 and 7 closely approximate, connate or stalked.

Mr. E. Meyrick made *Nothris* Hübner synonymous with *Ypsolophus*,¹ and the species hitherto placed in that genus in America, which are known to me, conform well with the definition of *Ypsolophus*, except *Nothris maligemmella* Murtfeldt, which is a *Blastobasid*, lately referred to the genus *Holcocera* Clemens,² and *Ypsolophus trimaculellus* Fitch, which has been discovered to belong to the family *Cecophoridae* and has been made the type of a new genus *Eumeyrickia* Busck.³

The other species probably belong in the present genus, but unfortunately some of them are known only from the descriptions, all authentic material being lost.

By continued breeding of good series of *Ypsolophus*, however, all of them may in time be rediscovered, but at present it is not safe from the more or less meager descriptions to even include them in the following table, which then only contains such species as are recognized at present.

Hindwings bluish, iridescent semitransparent.....	<i>ligulellus</i> , p. 921
Hindwings not so.....	1
1. Forewings with dark dorsal spot at apical third.....	<i>citrifoliellus</i> , p. 923
Forewings without such spot.....	2
2. Forewings with large black spot on disk.....	<i>aeqatoriellus</i> , p. 925
Forewings without large spot on disk.....	3
3. Forewings with distinct discal spots.....	4
Forewings without distinct discal spots.....	<i>cargafoliellus</i> , p. 923
4. Discal spots light brown.....	<i>punctidiscellus</i> , p. 922
Discal spots not light brown.....	5
5. With no white scales in discal spots.....	6
With white scales in discal spots.....	7
6. With apical row of black dots.....	<i>bipunctellus</i> , p. 923
Without such row of apical dots.....	<i>towneyellus</i> , p. 922
7. White part of discal spots large, prominent.....	<i>trinotellus</i> , p. 923
White part of discal spots small, not prominent.....	<i>ventrellus</i> , p. 924
Not included in synoptic table: <i>malifoliellus</i> , p. 925; <i>quercicellus</i> , p. 926; <i>rosocostellus</i> , p. 926; <i>bimaculellus</i> , p. 926; <i>grisseellus</i> , p. 927; <i>rusticus</i> , p. 927.	

¹ Trans. Ent. Soc. Lond., 1887, p. 274.

² Journ. New York Ent. Soc., X, 1902, p. 96.

³ Journ. N. Y. Ent. Soc., X, 1902, p. 94.

YPSOLOPHUS LIGULELLUS Hübner.

- Dichomeris ligulella* HÜBNER, Zuträge exot. Schmett, 1818, p. 70, figs. 143, 144.
Rhinocera pometella HARRIS, Cambridge Cron., July 17, 1853.
Chatochilus pometellus FITCH, Journ. N. Y. State Agr. Soc., IV, 1853, p. 36; Trans. N. Y. State Agr. Soc., XIII, 1854, p. 178.
Ypsolophus pometellus CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 166.—WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 186.—RILEY, Smith's List Lep. Bor. Am., No. 5527, 1891.—DIETZ, Smith's List Ins. New Jersey, 1900, p. 475.—SLINGERLAND, Cornell Univ. Agr. Exp. Sta. Bull., 1901, p. 187.
Chatochilus contubernatellus FITCH, Journ. N. Y. State Agr. Soc., IV, 1853, p. 36; Trans. N. Y. State Agr. Soc., XIII, 1854, p. 178.
Ypsolophus contubernatellus RILEY, Smith's List Lep. Bor. Am., No. 5525, 1891.
Ypsolophus pauciguttellus CLEMENS, Proc. Ent. Soc. Phila., II, 1863, p. 123; Stainton Ed. Tin. N. Am., 1872, p. 228.—ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 283.
Ypsolophus flavivittellus CLEMENS, Proc. Ent. Soc. Phila., II, 1863, p. 429; Stainton Ed. Tin. N. Am., 1872, p. 254.
Ypsolophus recdella CHAMBERS, Can. Ent., IV, 1872, p. 222.
Ypsolophus rudereella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 167.
Ypsolophus quercipomonella CHAMBERS, Can. Ent., IV, 1872, p. 222.—PACKARD, Rep. U. S. Ent. Comm., V., 1890, p. 202.
Ypsolophus ligulellus BUSCK, Dyar's List Amer. Lep., No. 5678, 1902.

In the U. S. National Museum are Fitch's types of *pometellus* and *contubernatellus*, and specimens labeled by Lord Walsingham (blue labels No. 666, 1195, 1222, and 1223); *pauciguttellus*, *pometellus*, *flavivittellus*, and *contubernatellus*=*quercipomonellus*=*flavivittellus*.

There are besides many specimens reared from oak and from apple in the insectary of the U. S. Department of Agriculture and also specimens from New York (Beutenmüller); Missouri (Murtfeldt); Georgia, from live oak (Schwarz); Kansas (Crèvecoeur); Pennsylvania (Heidemann); West Virginia (bred from oak); District of Columbia and Maryland (Busek). I have also determined specimens from New Jersey (Kearfott) and from New Mexico (Cockerell).

As the consensus of authorities is that Hübner's figures represent this species (the variety *flavivittellus* Clemens) and as additional evidence for or against this view can not be forthcoming, it seems rational to adopt Hübner's name instead of continuing to use the query.

Lord Walsingham is responsible for the entire synonymy¹ which Zeller already had indicated in part, and it must stand until disproved, the more so as new and careful observations by Mr. Slingerland, who has lately treated this insect very interestingly and exhaustively, seem to confirm it. But Lord Walsingham expresses a doubt, and it does seem to me likely, that at least two distinct species will be ultimately found to have been mixed up, one feeding on oak and one on apple.

From the material at my command at present, however, though quite large, no conclusions can be made, and I am unable to separate

¹Trans. Am. Ent. Soc. Phila., X, p 186.

the imagoes according to food plant therefrom, it being too scant and too uncertainly labeled. Most careful observations of the larva from both food plants with this object in view are necessary to clear up the question.

YPSOLOPHUS PUNCTIDISCELLUS Clemens.

Ypsolophus punctidiscellus CLEMENS, Proc. Ent. Soc. Phila., II, 1863, p. 123; Stainton Ed. Tin. N. Am., 1872, p. 228.—ZELLER, Verb. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 285.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 166.—RILEY, Smith's List Lep. Bor. Am., No. 5528, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5679, 1902.

Ypsolophus stramineellus CHAMBERS, Can. Ent., IV, 1872, p. 224; Bull. U. S. Geol. Surv., IV, 1878, p. 167.—RILEY, Smith's List Lep. Bor. Am., No. 5531, 1891.

A perfect specimen in the National Museum labeled "Boll. Texas," was determined by Lord Walsingham; it agrees perfectly with the description and undoubtedly represents this species, type of which, like the majority of Clemens' types, is lost.

I have several fine specimens collected in New Jersey by Mr. Kearfott and in the District of Columbia by myself. The species comes freely to light.

Chambers' description of *stramineellus*, of which no type is in existence, seems to warrant the synonym with Clemens' species, as suggested by Chambers himself.

YPSOLOPHUS TOUCEYELLUS Busck.

Anarsia trimaculella CHAMBERS, Can. Ent., VI, 1872, p. 243; Bull. U. S. Geol. Surv., IV, 1878, pp. 92, 129.—WALSINGHAM, Proc. Zool. Soc. Lond., 1891, p. 526.—RILEY, Smith's List Lep. Bor. Am., No. 5539, 1891.

Ypsolophus touceyellus BUSCK, Dyar's List Amer. Lep., No. 5680, 1902.

Renamed after the author, Victor Toucey Chambers.

By transferring this species to its proper genus the name *trimaculella* becomes preoccupied by *Ypsolophus* [*Chetochilus*] *trimaculellus* although, as I have shown, this is not an *Ypsolophus*, nor even a *Gedechiid*, but an *Ecophorid*, forming a new genus, *Eumeyrickia* Busck.¹

I have compared Chambers' type (no. 470) of *Anarsia trimaculella* in the U. S. National Museum and found it identical with a specimen in Cambridge Museum labeled by Chambers. This specimen was formerly the property of the Peabody Institute in Salem, Massachusetts, and bears Lord Walsingham's blue label no. 994, corresponding to his determination in his handwritten notebook: *Anarsia trimaculella* Chambers.

The National Museum specimen is Chambers' true type from Texas, while the Cambridge specimen is his later example from Kentucky.

The species is a true *Ypsolophus*. I have met with no other specimens.

¹ Journ. N. Y. Ent. Soc., X, 1902, p. 94.

YPSOLOPHUS BIPUNCTELLUS Walsingham.

Ypsolophus bipunctellus WALSINGHAM, Trans. Amer. Ent. Soc. Phila., X, 1886, p. 186.—RILEY, Smith's List Lep. Bor. Am., No. 5523, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5681, 1902.

The type of this species is in Professor Fernald's collection, where I have examined it; identical specimen from Nantucket Island, Massachusetts, is in the U. S. National Museum. (Ac. No. 34727.)

YPSOLOPHUS TRINOTELLUS Coquillett.

Nothris trinotella COQUILLETT, Papilio, III, 1883, p. 81.—PACKARD, Rep. U. S. Ent. Comm., V, 1890, p. 640.

Ypsolophus trinotellus BUSCK, Dyar's List Amer. Lep., No. 5682, 1902.

Type of this very distinct species is in Professor Fernald's collection in very poor condition, consisting of head, thorax, and one forewing. The species is, however, different from all others described, and easily recognized from the description.

Food plant.—Hazel.

Habitat.—Illinois.

YPSOLOPHUS CITRIFOLIELLUS Chambers.

Nothris citrifoliella CHAMBERS, Journ. Cinn. Soc. Nat. Hist., II, 1880, p. 184.—COMSTOCK, Rep. U. S. Dept. of Agr., 1880, p. 205.—RILEY, Smith's List Lep. Bor. Am., No. 5536, 1891.

Ypsolophus citrifoliellus BUSCK, Dyar's List Amer. Lep., No. 5683, 1902.

The original bred series from which Chambers described this species is still in U. S. National Museum in fine condition.

It is a very distinct, easily recognized species.

Food plant.—Orange.

Habitat.—Florida.

YPSOLOPHUS CARYÆFOLIELLUS, Chambers.

Ypsolophus caryæfoliella CHAMBERS, Can. Ent., IV, 1872, p. 224; Bull. U. S. Geol. Surv., IV, 1878, p. 166.

Ypsolophus caryæfoliellus RILEY, Smith's List Lep. Bor. Am., No. 5524, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5684, 1902.

A specimen in the U. S. National Museum determined by Lord Walsingham agrees well with Chambers' description (except that its alar expanse is 23 mm., not as Chambers' type, 21 mm.), and undoubtedly represents this species; it is from Miss Murtfeldt, Missouri. There is also a specimen from Texas (Beutenmüller). The species was described from Kentucky.

According to Chambers the larva is green, with six narrow, longitudinal, interrupted white lines; head ferruginous, first thoracic segment brown, thoracic feet black. At maturity it becomes white, suffused with pink, and with the longitudinal lines deep pink.

Food plant.—*Carya alba*.

YPSOLOPHUS VENTRELLUS Fitch.

Chaetochilus ventrellus FITCH, Trans. N. Y. State Agr. Soc., XIII, 1854, p. 234.

Ypsolophus ventrellus CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 167.—RILEY, Smith's List Lep. Bor. Am., No. 5534, 1891.—BUSCK, Dyar's List. Amer. Lep., No. 5685, 1902.

Ypsolophus unicipunctellus CLEMENS, Proc. Ent. Soc. Phila., II, 1860, p. 125; Stainton Ed. Tin. N. Am., 1872, p. 229.—ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 286.—CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 167.—WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 186.—RILEY, Smith's List Lep. Bor. Am., No. 5533, 1891.

Clemens' type of this species is lost, but in the U. S. National Museum are three specimens agreeing well with the description and determined as *unicipunctella* Clemens by Lord Walsingham, who has examined Clemens' type. These specimens undoubtedly represent Clemens' species; they are identical with Fitch's type of *ventrellus*, which was found with his large handwritten label in his collection now in U. S. National Museum.

There is also a series of bred specimens of this species. They bear the label of U. S. Department Agriculture, no. 242, and the following are Professor Riley's unpublished notes on the larva:

Found at Glenwood, Mo., folding up the leaves of the black oak in little tubes. Length, 0.60 of an inch. A striped white and black worm with a reddish brown head and cervical shield. Considering the ground color as white, there is a black dorsal line, somewhat restricted at the joints, and on each side of the dorsum is another somewhat wavy line separated from a lateral broader one only by a fine white line. Outer edge along stigmata white and underneath black glaucous.

Piliferous spots above quite large, black with a white annulation; two of them situated in black wavy line and one on lateral black line just above stigmata. Stigmata small, with a smaller piliferous spot just below it and others on venter. First segment dark brown below cervical shield; second segment darker than the others, with a white anterior edge. Last two segments almost entirely black above, being sharply separated from anus and anal prolegs, which are of a very light yellow color. Feet black, abdominal prolegs same as venter. Single white hairs from each spot.

On June 2, one changed to chrysalis. The chrysalis is formed within the leaf, the caterpillar first lining it with white silk.

The chrysalis averages 0.38 inch in length, with the abdomen comparatively narrow and small compared with the anterior half, the extremity tapering to a single point, of normal color, but characterized especially by having about six pairs of little elevations on the dorsum just behind the thorax and three others on each side of them along the upper edge of the wing sheets. Moth issued June 15-22.

The notes continue:

Zeller says it is the same as a variable, often lighter brown-spotted species, which he has often received from Ohio.¹

This bred series shows the extremes of the different ground colors, which Zeller mentions and proves his assertion that the species is variable in ground color from a very light yellow brown to a dark purplish brown.

¹ Riley, Notebook, IV, pp. 29-30.

YPSOLOPHUS EUPATORIELLUS Chambers.

Ypsolophus eupatoriella CHAMBERS, Can. Ent., IV, 1872, p. 221.

Nothris eupatoriella CHAMBERS, Can. Ent., IX, 1877, p. 23; Bull. U. S. Geol. Surv., IV, 1878, p. 158.

Nothris dolabella ZELLER, Verh. k. k. zool.-bot. Gesell. Wien, XXIII, 1873, p. 288.

Nothris setosella WALSINGHAM (not Clemens), Trans. Ent. Soc. Phila., 1882, p. 188.—RILEY, Smith's List Lep. Bor. Am., No. 5558, 1891.

Ypsolophus eupatoriellus BUSCK, Dyar's List Amer. Lep., No. 5686, 1902.

As explained previously (p. 911), it seems to me unwarranted to make *Trichotaphe setosella* Clemens a synonym of this species. Lord Walsingham, who made it so, did not have Clemens' type, but came to a conclusion from a specimen in C. T. Robinson's collection, labeled *setosella*. It seems more reasonable to believe this specimen wrongly labeled and to accept Clemens' word, that his *setosella* is a *Trichotaphe* species.

I have bred good series of the present species from *Eupatorium* in the District of Columbia, and in U. S. National Museum are besides specimens from the following localities: Florida (Dyar), Texas (Bentzenmüller), Arizona (Schwarz), Kansas (Crevecoeur), New York (Banks), Virginia and Maryland (Busck).

The males of this species have an interesting secondary sexual character, which I have not noticed in any other Gelechiid, namely, a strong pencil of long yellow hairs on thorax just below costal base of fore wings. This pencil can be expanded into a whorl of hairs which envelops the eyes and base of the palpi as a veil.

If—what is to be presumed—this pencil in the male is thus expanded during courtship, the insect may indeed be said to have reached in this respect the standpoint of man, whom love makes blind.

The larva feeds in a leaf folded from the edge and pupates within the fold. When full grown it is about 15 mm. long, cylindrical, tapering slightly. Head polished, jet black, longer than wide, semihorizontal, mouth parts brownish. Width of head, 1 mm.

Thoracic shield polished black, straight in front, rounded posteriorly, twice as wide as long. The rest of the body is greenish white, turning at maturity to wine red with white veins; tubercles small, black, hairs short black, anal plate only slightly cornified, light brown. Legs normal, first thoracic feet black, the others whitish; abdominal prolegs with complete circle of small hooks.

Two generations, at least, are found in the locality of Washington, the imagoes issuing in July and late in September.

YPSOLOPHUS MALIFOLIELLUS Fitch.

Chatochilus malifoliellus FITCH, Trans. N. Y. State Agr. Soc., XIII, 1854, p. 231.

Ypsolophus malifoliellus CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 166.—

RILEY, Smith's List Lep. Bor. Am., No. 5526, 1891.—Busck, Dyar's List Amer. Lep., No. 5687, 1903.

I have not recognized this species, which, as Fitch himself surmised, very likely is only one of the many varieties of *ligulellus*.

There is in the U. S. National Museum, under type No. 469, a specimen (one forewing only!) recorded as collected by and received from Fitch as type of *malifoliella* and bearing a label presumably in Fitch's writing, "*Depressaria malifoliella*."

This forewing can not be made to agree with Fitch's description of *Ypsolophus malifoliellus*, and is probably the type of one of Fitch's many manuscript species. It is a wing of *Machimia tentoriferella* Clemens and has no connection with the present species.

YPSOLOPHUS QUERCIELLUS Chambers.

Ypsolophus querciella CHAMBERS, Can. Ent., IV, 1872, p. 223; Bull. U. S. Geol. Surv., IV, 1878, p. 83; Journ. Cinn. Soc. Nat. Hist., II, 1880, p. 202, fig. 16.—WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 186.

Ypsolophus quercicella CHAMBERS, Bull. U. S. Geol. Surv., IV, 1878, p. 167.

Ypsolophus quercicellus RILEY, Smith's List Lep. Bor. Am., No. 5529, 1891.

Ypsolophus querciellus BUSCK, Dyar's List Amer. Lep., No. 5688, 1902.

The type of the species was lost and no authentic specimen is now in existence. Chambers suggested that it probably rather should be placed under *Depressaria*, but his delineation of the venation shows, if it can be relied upon, that it can not be a *Depressaria*, and provisionally, at least, it must be retained in *Ypsolophus*.

From the fact that it was bred from oak, and that a description, even if meager, was given of the larva, there is some hope of rediscovering the species in time.

Habitat.—Kentucky.

YPSOLOPHUS ROSEOCOSTELLUS Walsingham.

Ypsolophus roseocostellus WALSINGHAM, Trans. Am. Ent. Soc. Phila., X, 1882, p. 185.—RILEY, Smith's List Lep. Bor. Am., No. 5530, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5689, 1902.

I am not acquainted with this species, which for some reason I failed to get notes on while in Amherst, where the type is found in Professor Fernald's collection.

In the U. S. National Museum is a specimen labeled in Walsingham's handwriting *Y. roseocostellus*, but there must be some mistake, as it does not agree with his description, and belongs to *Ypsolophus ventrellus* Fitch, a much larger and more broad-winged species.

YPSOLOPHUS BIMACULELLUS Chambers.

Nothris bimaculella CHAMBERS, Bull. U. S. Geol. Surv., III, 1877, p. 122; Journ. Cinn. Soc. Nat. Hist., II, 1880, p. 184.—RILEY, Smith's List Lep. Bor. Am., No. 5535, 1891.

Ypsolophus bimaculellus BUSCK, Dyar's List Amer. Lep., No. 5690, 1902.

The type of this species is in the Cambridge Museum of Comparative Zoology, but it is in so miserable a condition that it can not be identified specifically. It is, however, a true *Ypsolophus*, as the description would indicate.

YPSOLOPHUS GRISSEELLUS Chambers.

Nothris grisseella CHAMBERS, Can. Ent., VI, 1874, p. 245; Bull. U. S. Geol. Surv., IV, 1878, p. 158.—RILEY, Smith's List Lep. Bor. Am., No. 5537, 1891.

Ypsolophus grisseellus BUSCK, Dyar's List Amer. Lep., No. 5691, 1902.

Described from a single specimen now not in existence.

I have not recognized the species from the description, and it must remain at present as a doubtful species.

YPSOLOPHUS RUSTICUS Walsingham.

Ypsolophus rusticus WALSINGHAM, Proc. Zool. Soc. Lond., 1891, p. 525; 1897, p. 86.—BUSCK, Dyar's List Amer. Lep., No. 5692, 1902.

This species was described from St. Vincent Island, West Indies, and was recorded by Lord Walsingham from Texas.

The slight differences, which Lord Walsingham pointed out, from *Ypsolophus touceyellus* (*Anarsia trimaculellus* Chambers), to which species Walsingham originally had referred his specimen, do hardly seem to hold, and likely it will be found synonymous with that species.

Until large bred series of Chambers' species is obtained and definite proof found to the opposite, *rusticus* must however be retained as a separate species.

Mr. J. Hardley Durrant wrote me (letter of May 10, 1901) about this species as follows:

We have one specimen named *Anarsia trimaculella* Chambers. It is in poor condition and is extremely similar to *Ypsolophus rusticus*. It appears, however, to belong to the genus *Begoe* Chambers=*Malacotricha* Zeller. I might have thought that it was *rusticus*, with denuded palpi, but the shape of the wings seems different, and the male genitalia strongly suggest *Begoe*. The whole question hinges on whether the differences are constant. I gather that you [the writer] have not sufficient material to decide this, nor have we. It would therefore be wiser to leave them as distinct, with a note under each that if they varied they should be united, when naturally *rusticus* will stand. Meanwhile your new name for *trimaculellus* Chambers, is unobjectionable.

It seems highly probable that Lord Walsingham's supposed specimen of *Anarsia trimaculella* is the very similar *Gelechia trimaculella* Chambers, which is a *Trichotaphe* (*Begoe*) (p. 914), and not the present species, and consequently still more reasonable that *rusticus* is equal *touceyellus* (*trimaculella* Chambers), which name it eventually must suppress. But to avoid more confusion it is safest to retain the two names until comparison of specimens can be obtained.

ANARSIA Zeller.

Plate XXXII, fig. 37.

Anarsia ZELLER, Isis, 1839, p. 190.

Second joint of labial palpi with dense projecting tuft beneath; terminal joint in male very short, concealed; in female, long, exposed.

Forewings elongate pointed; 12 veins, 7 and 8 stalked, 6 out of base of 7. Hindwings as broad as forewings; apex pointed, termen slightly sinuate; 8 veins, 3 and 4 connate, 5 approximate to 4, 6 and 7 stalked.

Of the four species included under this genus in Riley's list, *trimaculella* has just been treated under *Ypsolophus* [p. 922], and *belfragesella* Chambers was found to be synonymous with *Leuce fuscocristatella* Chambers [p. 794]. One other of Chambers' species described under the generic name *Anarsia*, namely, *albapulvella*, has been found to be an Oecophorid equal to *Chimabache haustellata* Walsingham, now known under the name *Eumeyrickia trimaculella* Fitch,¹ consequently we can not be very confident about Chambers' understanding of the genus *Anarsia*, and his last species *suffusella*, type of which is lost and which has not been rediscovered as yet from his description, is retained in the present genus simply because it can not be placed anywhere else at the present time, but it will quite surely be found not to belong in this genus. I have, therefore, not made any table for the separation of this and the only true *Anarsia* of which we are sure in this country, *lineatella* Zeller.

ANARSIA LINEATELLA Zeller.

Anarsia lineatella ZELLER, Isis, 1839, p. 190.—STAUDINGER and REBEL, Cat. Lep. Eur., II, No. 2999, 1901.—CHAMBERS, Can. Ent., IV, 1872, p. 208; Bull. U. S. Geol. Surv., IV, 1878, p. 129.—RILEY, Smith's List Lep. Bor. Am., No. 5540, 1891.—DIETZ, Smith's List Ins. N. Jersey, 1900, p. 475.—BUSCK, Dyar's List Amer. Lep., No. 5693, 1902.

Anarsia pruniella CLEMENS, Proc. Acad. Nat. Sci. Phila., 1860, p. 169; Stainton Ed. N. Am. Tin., 1872, pp. 36, 128.—CHAMBERS, Can. Ent., IV, 1872, p. 208; Can. Ent., VI, 1874, p. 243.

This common insect is at times of some economic importance owing to the injury of its larva to peaches and plums. The most commonly observed damages is to the young shoots which the larva enters and kills, but the injury to the fruit itself is sometimes quite as aggravating, as in a case in the District of Columbia which was under the writer's observation in the summer of 1901, where the larvæ occurred in such numbers as to spoil for market purposes nearly the entire large crop of beautiful, nearly ripe peaches. In nearly every one was found the larva, which had eaten into the stone and left the adjoining parts tunnelled and filled with its unappetizing frass.

¹ Journ. N. Y. Ent. Soc., p. 94.

References to the large economic literature has not been attempted; they may be found in part in the comprehensive article on this insect by Mr. C. L. Marlatt.¹

ANARSIA SUFFUSELLA Chambers.

Anarsia suffusella CHAMBERS, Can. Ent., VI, 1874, p. 243; Bull. U. S. Geol. Surv., IV, 1878, p. 129.—RILEY, Smith's List Lep. Bor. Am., No. 5541, 1891.—BUSCK, Dyar's List Amer. Lep., No. 5694, 1902.

This insect, which was described from Texas, will in my judgment be found to be a species of *Ypsolophus* when it is rediscovered.

No authentic material is existent and I have not recognized it as yet from Chambers' description.

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¹U. S. Dept. Agricult., Div. of Entom., Bull. 10, new series, 1898, p. 7.

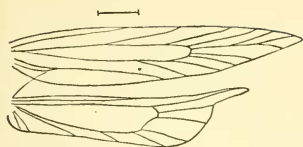
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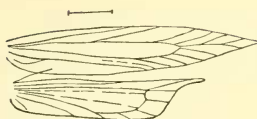
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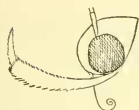
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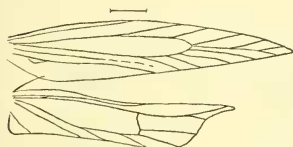
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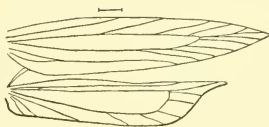
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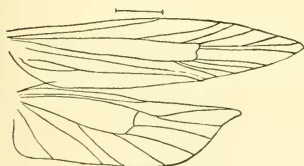
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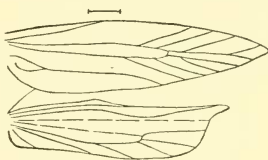
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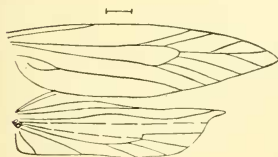
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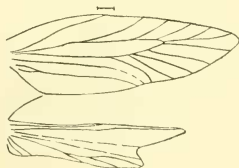
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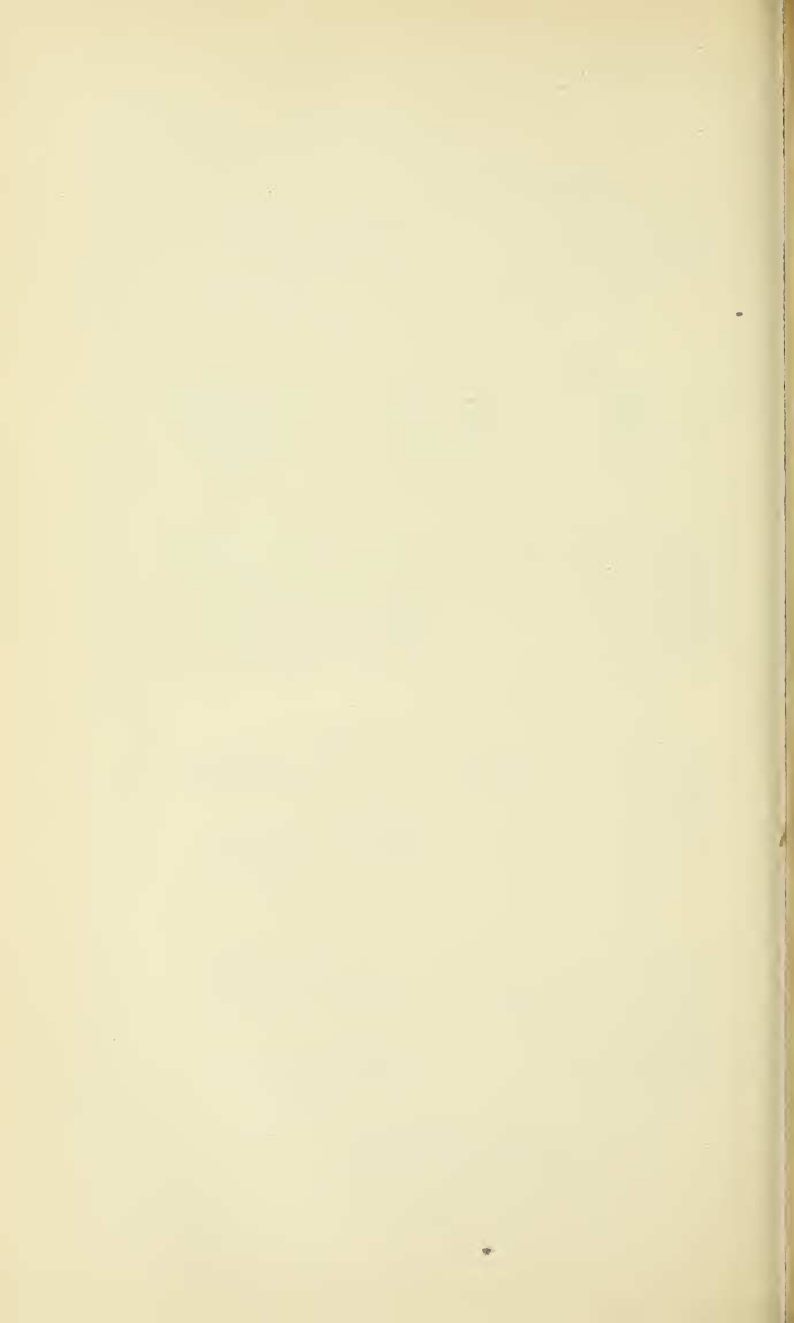
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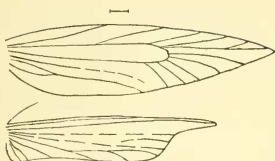


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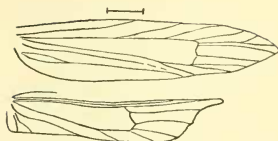
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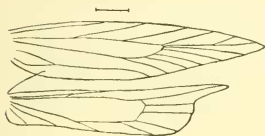




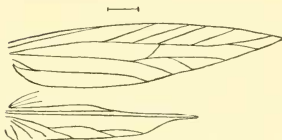
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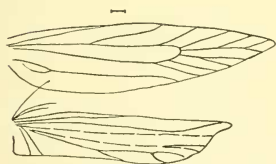
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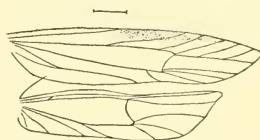
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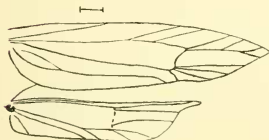
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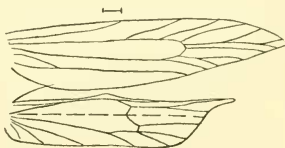
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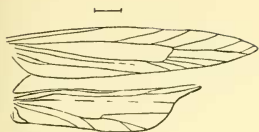
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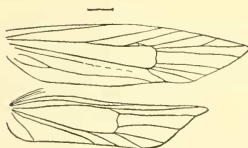
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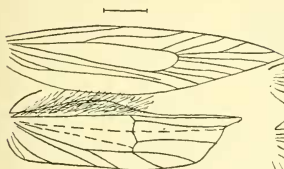
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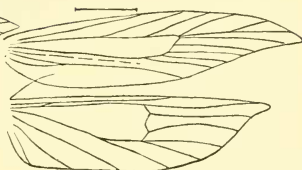
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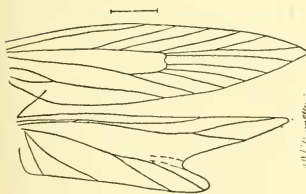
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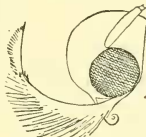
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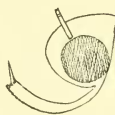
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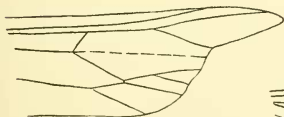
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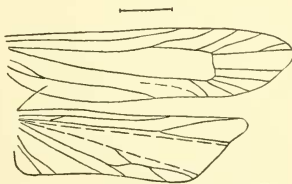
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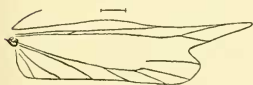
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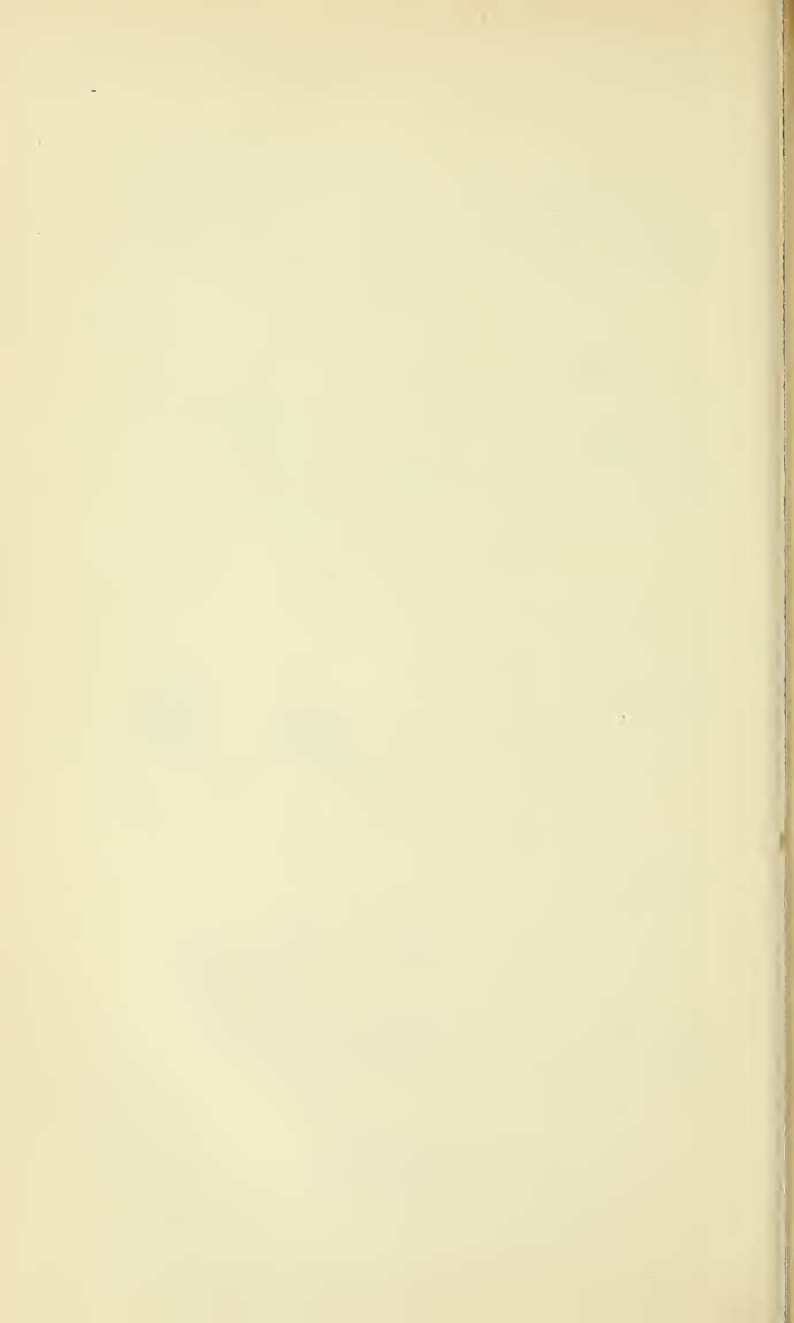
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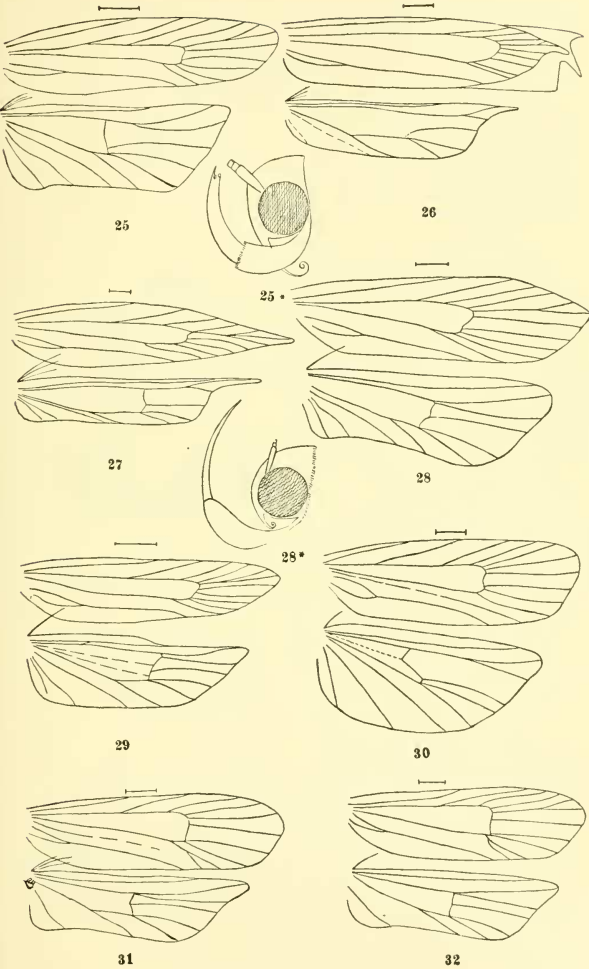


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FOR EXPLANATION OF PLATE SEE PAGES 929, 930.





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FOR EXPLANATION OF PLATE SEE PAGE 930.

